The RUBBER AGE

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Late News of the Rubber Industry

Rubber Company Stock Issues Drop $300,000,000 in Value

SINCE reaching their peaks for the current year in the late winter and early spring boom, stock issues of the leading domestic rubber manufacturing companies have steadily declined in market valuation on the various stock exchanges of the country until at the lowest point of the September trading they had shown a loss of more than $300,000,000. While this deflation is regarded as a technical correction of prices that had been forced up too high rather than anything in the nature of a collapse, it nevertheless reflects Wall Street's opinion of the rubber industry.

The common stock issues of six of the leading tire and rubber companies alone have declined in market value from their 1929 peak to their September low to the amount of $223,142,648. Were the preferred issues of these same companies figured in the total, the paper loss would be at least $260,000,000. In addition, seven of the smaller tire companies have dropped approximately $40,000,000 in market valuation in the last six months.

Goodyear Tire & Rubber Company common, being the largest and most active rubber issue on the New York Stock Exchange, heads the list with a fall from its high of 154½ attained late in March to a low of 98½ near the close of last month. This means that its outstanding 1,398,126 shares have declined to a total of $78,295,056. The Goodyear preferred issue has also fallen off $4,316,000 from its high for the year, and even the 5 per cent bonds of the company have dropped from 95 to 88, indicating a loss of several million dollars more.

Firestone Tire & Rubber Company common, selling at the highest price of any security in the industry, has experienced the greatest fall, dropping 106½ points from a high of 309 to a low of 202½. Because of the smaller number of shares outstanding, the actual drop in its market valuation was only half that of Goodyear's at $39,414,585. In recent days, however, this issue has regained about 55 points and bids fair to make an interesting comeback.

Goodrich common following the Hood merger, sank to a low of 68 as compared with its 1929 high of 105¾. This indicates a loss of $35,999,835 on the amount of common outstanding before the Hood consolidation. Other losses in common stock value among the "big five" were $29,136,480 by United States Rubber and $23,009,292 by Fisk Rubber. In addition, the U. S. preferred issue has fallen off to the amount of $14,975,093, the Fisk preferred issues more than $7,000,000, and the Fisk 5½ per cent bonds from 96 to 71. Kelly-Springfield had the heaviest losses of the smaller companies, its common and preferred issues together declining more than $20,000,000 in market value.

The losses per share of other tire company common stocks have been Ajax, 8¾; General, 48; India, 38; Lee, 14½; Miller, 18⅝; Mohawk, 44; and Seiberling, 40. Quotations for Miller preferred dropped from 85 to as low as 35, and the senior issues of some of the others have also declined in sympathy with the common.

The high for the year, the low point for last month, and the resultant loss per share and for all outstanding common shares of six typical rubber companies follow:

	1929 *high*	*Sept. low*	*Loss per share*	*Total loss in value*
Firestone	309	202½	106½	$39,414,585
Fisk	20⅛	6⅝	13½	23,009,292
Goodrich	105¾	68	37¾	35,999,835
Goodyear	154½	98½	56	78,295,056
Kelly-Springfield	24	7¾	16¼	17,287,400
United States	65	45	20	29,136,480
Total Loss in Value				$223,142,648

Record Year Now Assured for Automotive Accessory Industry

THE parts-accessory industry has fully enjoyed the prosperity which has marked the automotive vehicle business this year, and at the end of August had completed its greatest eight months' period in production and sales, according to the Motor and Equipment Association, of which several rubber manufacturers are members. During August some normal slowing up in production was noticed and this continued in September. Operations are still at a satisfactory level, however, and moderately reduced schedules for the remainder of the year, a natural result of the unusually heavy production of the first half, will still allow the industry to make a new all-time year record by the end of 1929.

Shipments of units and parts to car manufacturers for original equipment declined from July and were also below August last year. August was the first month in which shipments for this group fell below last year. Service parts business scored an impressive gain over July but was below August, 1928.

Aggregate shipments in August of several hundred manufacturers supplying parts and accessories to the car and truck manufacturers and parts, accessories and garage repair equipment to the wholesale trade were 182 per cent of the January 1925 base, as compared with 188 in July, 208 in June and 212 in August last year.

Goodyear Balloon is Winner In Close International Race

ALTHOUGH lack of any appreciable wind kept all contestants from traveling very great distances, Ward T. Van Orman, piloting the Goodyear VIII balloon for the Goodyear Tire & Rubber Company, managed to win out by a narrow margin over the closest of his eight rivals in the annual James Gordon Bennett international balloon race from St. Louis, Mo., on September 29. Van Orman, with Alan MacCracken as his aide, piloted the Goodyear entry to a point about three miles north of Troy, O., and approximately 350 miles from the starting place of the contest. The entry of the United States Army, piloted

The Goodyear balloon about to leave St. Louis in the International James Gordon Bennett race

by Captain William E. Kepner, winner of the 1928 race, landed on a reservoir at Celina, O., and was second with distance estimated at 345 miles.

Three American balloons outdistanced all the six foreign entries. Next in place after Van Orman and Kepner was the United States Navy bag, piloted by Lieutenant T. G. W. Settle and Lieutenant Winfield Bushnell, winners of the 1929 national race, who landed 10 miles southwest of Easton, O., about 315 miles from St. Louis. The other entrants, representing Belgium, Argentina, England, France, Germany, and Switzerland, were forced to land in Illinois and Indiana.

Van Orman in 1919 traveled from St. Louis to a point near Montreal before he was forced down by a severe gale after covering 1,050 miles, but the United States record flight was made in 1909 when Allen Hawley and August Post traveled 1,173 miles from the same starting point. This year Van Orman's balloon was equipped with a lightning shield, invented by himself, to prevent a recurrence of the disaster in the 1928 national race when his bag was struck by lightning and his aide, Walter W. Morton, killed.

Faultless Calls Preferred, Increases Common Dividends

DIRECTORS of the Faultless Rubber Company, meeting at Ashland, O., on September 27, voted for the calling of the company's preferred stock, the raising of the dividend rate on the common issue, and the granting of rights to subscribe to more common stock. In declaring a dividend of 62½ cents on the common stock, the directors raised that issue from the basis of $2 a year to $2.50. The company has been paying at the $2 rate since October, 1925.

In its action on the preferred issue, the board directed that all stock of this class outstanding, amounting to $493,300, be called for redemption on November 15 at 105 and accrued dividend. The calling of this issue will leave the common in the place of priority in the matter of dividends.

A "melon" in rights was given the common stockholders in granting them the right to subscribe at $30 a share for additional shares at the rate of 16 for each 100 now held. The rights accrue to holders of record on October 5 and are to be exercised on or before November 1. As there are outstanding 62,530 shares of common stock, the total additional shares to be issued will reach 10,000 and, if all rights are exercised, will bring $300,000 into the treasury of the company.

The stock, which early last month was selling near its 1929 low of $30, rose suddenly to a new high of $45 and is currently quoted slightly below that figure. It is listed on the Cleveland Stock Exchange.

Los Angeles Chemists Hear C. R. Johnson on "Carbon Blacks"

SPEAKING before 50 members at the eighth meeting of the Los Angeles Group of the Rubber Division of the American Chemical Society on September 20, C. R. Johnson, of Godfrey L. Cabot, Inc., presented lantern slides along with his talk on "Carbon Blacks." The interesting series of pictures, covering the various important steps in carbon black manufacture, prepared the group with a definite visual background for the facts and figures on this topic.

"We are just on the edge of learning something about carbon black," said Mr. Johnson in opening his discussion on this subject. "We are really beginning to get some definite picture of this substance. It is not pure carbon, because it has been found that there is also oxygen and hydrogen present in carbon black, as well as moisture. The oxygen amounts to 4½ or 5 per cent, the hydrogen .8 per cent, and the moisture from ½ to 2½ per cent.

"The volatile content of carbon black furnishes one measuring stick for determining its characteristics. Consequently, numerous experiments have been conducted with carbon black by heating at various temperatures up to 955 degrees C. to determine the volatile reaction product."

At this point a series of graphs and figure tables was projected on the screen for careful study to show the reactions which took place during the heating of carbon black. A number of x-ray pictures of carbon black proved to be quite interesting in showing some indication of the possibilities of determining the particle size of the substance.

"The two main users of carbon black are the rubber industry and the printing ink trade," Mr. Johnson continued. "So far there has been no satisfactory substitute for carbon black in preparing printing inks. The modern speed presses all over the world demand a carbon black pigment of intense covering power. However, with the rubber industry, tires and other rubber products could still be manufactured should the supply of carbon black be cut off, but, of course, tread wear would be greatly reduced. In 1923, the production of carbon black amounted to over 100,000,000 pounds, while today this figure has been trebled."

Asked why there was a difference in carbon black from different plants, the speaker said that, although considerable experimenting has been done along this line to determine the exact reasons for differences, it was impossible to give an accurate analysis of the causes within the carbon itself. "Differences in fuel used, ventilation, time of exposure to flames, and the construction of the carbon black plants all

play a part," he stated. "However, with continued research in the carbon black industry, it is expected that a definite method of rating and determining the exact properties of every sample will be devised for standard practice."

Methods of producing and handling the carbon black were also discussed. Mr. Johnson described the plant control used by Cabot to eliminate from production, all black unsuitable for use in rubber.

Following the Los Angeles Group meeting, Mr. Johnson left that city by airplane for Kansas City on his way east, so as to be able to reach Atlantic City in time to present a paper at the session of the Rubber Division of the American Chemical Society there.

September Rubber Consumption Is Figured Below 36,000 Tons

BASING their estimates on current operations at tire factories, members of the Rubber Exchange of New York, Inc., have placed consumption of crude rubber during September at between 35,000 and 36,000 tons. This would represent a decline of approximately 2,500 to 3,000 tons from the August consumption rate as well as from September last year.

In only one instance—during the year 1924,—has consumption of rubber in the United States shown an increase over August, it was pointed out.

Consumption for the nine months of the year will establish a new high record, notwithstanding, amounting to 385,108 long tons, as compared with 331,787 for the corresponding period last year, and with 291,953 tons for the first nine months of 1927.

Chain Store Firm Buys National Tire & Rubber

THE plant of the National Tire & Rubber Company at East Palestine, O., which has been idle for more than a year, has been acquired by Thomas Brothers, Inc., of Canton, O., it has been announced by L. M. Kyes, secretary and counsel to the tire company. The Canton firm operates a chain of tire stores in Ohio and Pennsylvania in addition to doing a wide wholesale business in tires and tubes. It is said that the East Palestine factory will be placed in operation early in December.

The National Tire & Rubber Company, established in 1913, formerly manufactured Remington heavy duty shock pad cords, National shock pad balloon cords, Remington cords, Criterion cords, Remington heavy duty tubes, National Trufit tubes and Criterion tubes. In recent years it has found difficulty in keeping pace with the increasing competition in the tire industry. Financial troubles in 1927 were followed by a reorganization in January, 1928, and later last year operations were suspended.

An advisory committee of the larger creditors, headed by Charles Seligson of the National Surety Company, announced on January 5, 1929, that a complete reorganization would take place with the aim of liquidating the then current liabilities of approximately $200,000. The full total of liabilities was figured at that time at $742,680, including the preferred stock issue of $246,800, the common stock issue of $276,195, and the reserve of $21,285. At that time Mr. Kyes was directed to obtain the majority of the voting stock endorsed in blank and the resignation of all the officers and directors of the corporation, all of which was to be held in escrow by the chairman of the advisory committee, pending outcome of negotiations for a reorganization of the business.

Seiberling Price Fixing Plan Is Criticized By Henderson

ANNOUNCEMENT by F. A. Seiberling, president of the Seiberling Rubber Company and of the Rubber Manufacturers Association, that plans to stabilize the price of crude rubber on a basis that would stimulate planting had been formulated at a conference in London was received with mixed opinions by the trade in this country. The statement had an electric effect on the market for rubber futures, causing a sharp rise in quotations, but was criticized by F. R. Henderson, president of the Rubber Exchange of New York, who declared that such a move would do more harm than good.

Mr. Seiberling, according to newspaper reports after his arrival at New York on the *Berengaria* October 4, said that the London conference during the last week in September was attended by 25 members of the Rubber Growers' Association, all of whom approved the price fixing plan. Besides Mr. Seiberling, American rubber interests were said to be represented by Edgar B. Davis, a large stockholder in the Goodyear Tire & Rubber Company and the United States Rubber Company, and Walter B. Mahony, a Goodyear director and publisher of the *North American Review.*

"Our interest as American manufacturers," said Mr. Seiberling, "is to secure an adequate supply of crude rubber at a reasonable price. In the past a monstrous situation has obtained. In one year prices fluctuated from 12 cents to $1.20 a pound. This instability of price has cost American manufacturers $300,000,000 a year. Naturally, we want to terminate it.

"The conference in London had an international aspect and there is every reason to believe that its results will be far-reaching and beneficial to the rubber industry. The leading Holland grower, who virtually controls the production of Sumatra, was represented together with the leading interests of the United States and England."

Just what form the stabilizing measure would take was not made clear. One New York dealer stated from London advices that it had been proposed to "take an amount of crude from the market" sufficient to bring values up to profitable levels, and that enough capital had been secured for this purpose.

Mr. Henderson stated that, while it would be unfair to criticize such a plan without further details, he believed that there is little need for such action at present. "Most people in the industry recognize that a few years ahead we may have some concern regarding the necessary supply to meet the ever-increasing demand for rubber the world over," he said. "The way to provide for such a contingency, however, is to plant more rubber and not to endeavor to correct the situation by employing price-fixing methods which are economically unsound and are very apt to lead to misunderstandings through the natural conflict of opinion between producer and consumer.

"We had six years of British restriction of rubber exports, from 1922 to 1928, during which a low point of 15 cents a pound and a high of $1.21 was reached," Mr. Henderson said. "The maximum fluctuation in any one year was in 1925, when prices ranged from about 35 cents to $1.21.

"Since restriction was removed and the market left alone, supply and demand have dictated prices. So far this year we have had a low price of 18 cents and a high of 28 cents. The high figure was reached at a time when the rubber manufacturing business was at its height. As consumption eased off and supplies continued, this was soon reflected in the market."

Atlantic City Meeting of the RUBBER DIVISION, A.C.S.

Over 200 Chemists Attend Meeting at Haddon Hall Hotel—W. F. V. Cox and Dr. H. E. Howe Guests at Banquet—Stanley Krall Elected Chairman

WHAT was generally considered one of the most successful annual meetings of the Rubber Division of the American Chemical Society, was held at Atlantic City, N. J., September 26 and 27. Over 200 members and guests attended the meeting, which was the first annual meeting in a number of years which was not held co-jointly with the regular meeting of the parent society, which met this year in Minneapolis, Minn., on September 9 to 14. On account of the distance of this latter location from the eastern rubber manufacturing centers, the Rubber Division decided to meet at Atlantic City, as the hosts of the New York Group.

Not only were the arrangements and program perfectly arranged in every way but the weather and surroundings of the selected location left nothing to be desired. The various committees on registration, arrangements, program, transportation and entertainment are to be congratulated on the effective work accomplished. Golf, bathing and fishing were the diversions (among others) provided for the men, while the ladies present, though not indulging in the fishing trip were offered luncheons, rolling chair parties, a theatre party, teas, and trips to the various piers, in addition to golf and bathing. Mrs. S. M. Cadwell was in charge of the ladies' program.

A Stroll Between the Sessions
Left to Right—W. A. Cope *(Vanderbilt)*, A. H. Smith *(R. S. L.)*, H. E. Simmons *(Akron University)*, Wm. Seguire, Jr. *(Krebs)*, J. E. Skane *(Manhattan)*

New Officers
1929-1930
Rubber Division, A.C.S.

Chairman: STANLEY KRALL, Fisk Rubber Company.
Vice-Chairman: H. A. WINKELMANN, Philadelphia Rubber Works Company.
Secretary-Treasurer: H. E. SIMMONS, Akron University.
Sergeant-at-Arms: E. R. BRIDGWATER, E. I. DuPont de Nemours & Company.
Executive Committee:
W. A. GIBBONS, United States Rubber Company.
N. A. SHEPARD, Firestone Tire & Rubber Company.
L. B. SEBRELL, Goodyear Tire & Rubber Company.
A. H. SMITH, Rubber Service Laboratories Company.
IRA WILLIAMS, E. I. DuPont de Nemours & Company.

The meeting at Atlantic City got under way at Haddon Hall Hotel after registration on Thursday morning, September 26, with the presentation of four papers at the morning session. The afternoon was given over to informal meetings and sport events. In the evening the banquet of the Division was held in the Rutland Room of the hotel. In addition to an excellent program of music during the

dinner, a number of vocal selections were rendered by Messrs. Prosser and Evans. Another hit of the evening, however, was Mrs. John McGavack, wife of one of the members, who sang several selections so effectively that she was forced to render encore after encore. Walter Grote, member of the Division, also entertained with a number of mystifying card tricks.

The honored guest of the evening was W. F. V. Cox, secretary of the Institute of the Rubber Industry, London. Mr. Cox was introduced by W. B. Wiegand, who acted as toastmaster. Mr. Cox brought the greetings of the Institution of the Rubber Industry to the Rubber Division and thanked the members for the invitation to be present. He explained the functions of the Institution of the Rubber Industry and told of the work it had been doing in the formation of rubber trade schools for the education and training of British youths along the lines best suiting them for a career in the rubber industry. The other speaker was Dr. H. E. Howe, editor of *Industrial and Chemical Engineering*, who spoke on the trend of technical knowledge and training as evidenced by the greater call for technical experts in rubber and other industries. A. H. Smith, retiring chairman of the division, also spoke briefly on the activity and growth of the Rubber Division.

On Friday morning the sessions were resumed and the balance of the technical papers were read. The business meeting followed the conclusion of the last paper. This included the elections of officers for the ensuing year and the reports of the Papers Committee and the Physical Testing Committee. The results of the elections are given above. Dr. Fisher, chairman, read the report of the Papers Committee, including a number of recommendations. It was suggested that all papers to be presented before the Division be in the hands of the secretary at least six weeks in advance of the meeting so that a reviewer's committee can examine them and make recommendations in regard to the time to be allotted to each, the suitability of the lantern slides and illustrations and the suggested lines of discussion.

The report of the Physical Testing Committee was read by Dr. W. A. Gibbons, chairman, and reviewed the committee's activities in obtaining the necessary information on the variable conditions surrounding crude rubber specifications, as practiced by various rubber companies. It was found that these methods varied widely in important essentials but an attempt has been made to draw up a tentative standard specification which will be ready shortly for consideration. Results of the committee's study on the effect of temperature and humidity on testing has been previously published.

The Resolutions Committee, through Dr. Winkelmann, chairman, recommended a vote of thanks to the New York Group for the part it had played in making the meeting such a success. Thanks were also expressed to the various committees, to Mrs. McGavack and the management of Haddon Hall Hotel for their cooperation and assistance in connection with the meeting. The Division also sent greetings to the Institution of the Rubber Industry in London, through its secretary, W. F. V. Cox.

Promenading on the Boardwalk

Left to Right—L. A. Beaver *(Philadelphia Rubber);* R. D. Gartrell *(Dominion Rubber);* W. F. V. Cox *(I. R. I.);* H. F. Palmer *(Xylos);* H. A. Winkelmann *(Philadelphia Rubber);* H. L. Fisher *(U. S. Rubber);* W. F. Zimmerli *(R. & H.)*

Abstracts of Papers Presented Before the Atlantic City Meeting

(Given in the order of presentation, with the time consumed in delivery, exclusive of the ensuing discussion.)

The Effect of Temperature, Pressure, and Humidity on the Permeability of Rubber to Air.

V. N. Morris and J. N. Street. (19 *minutes*)

Although the permeability of rubber to hydrogen has been studied considerably in connection with balloon fabrics, the permeability to air has been given very little attention. The present paper describes an apparatus used in a study of permeability of rubber stocks to

air, and gives the results of the investigation of the effect of certain experimental conditions on permeability. The apparatus used was so arranged that the rubber sample to be tested served as a membrane separating two air chambers. The air pressure in one chamber was increased considerably above atmospheric, while that in the other was decreased to slightly less than that of the atmosphere. The passage of air through the membrane was followed by means of a manometer attached to the low pressure chamber. The permeability of rubber to air was found to be approximately proportional to total pressure. The temperature coefficient of permeability is very high, thus indicating that it is desirable to check tire pressures much more frequently in summer than in winter. Although moisture is capable of affecting the permeability slightly the effect of the moisture in the atmosphere is ordinarily almost negligible.

The Aging of Vulcanized Rubber Under Varying Elongation.

A. A. Somerville, J. M. Ball and W. H. Cope. (40 *minutes*)

Test rings representing 66 compounds were stretched and held at nine different elongations from 0 to 100 per cent, then aged by four different methods, *viz.*, in oven, bomb, ozone, and sunlight. Tensile strength was plotted against per cent elongation. Thirteen different factors were studied, such as effect of various fillers, volume loading, accelerators, antioxidants, softeners, vulcanizing agents, crude rubbers including synthetic, as well as varying amounts of sulfur, times of cure, and ageing periods.

Deterioration in the oven is approximately 30 per cent greater at 100 per cent elongation than at 0 per cent, while in the bomb it is almost independent of elongation. Deterioration in ozone is greatest at 5 and 10 per cent elongations and is analogous to that obtained in sunlight at the various elongations. Cracking of the test rings occurs in both ozone and sunlight when the rings are stretched, but not in the oven or bomb; and is greatest at 5 and 10 per cent longations. Carbon black shows marked deterioration in ozone and sunlight at about 10 per cent elongation which is equivalent to the amount of stretch in a tire side-wall under inflation.

The aging of rubber bands was also studied under elongations of from 0 to 700 per cent.

Carbon Black. II. The Role of Oxygen.

C. R. Johnson. (*26 minutes*)

Following the work of Carson and others on adsorption in connection with carbon black, work has been done, studying adsorption with reference to its influence on the quality of carbon black in rubber.

Previous work has somewhat indicated the role which oxygen plays in connection with the properties of carbon black. This paper will attempt to extend our knowledge in this respect. It is expected to show more exactly just how the oxygen is combined physically and chemically with carbon black. Numerous examples of its behavior under conditions of chemical contact, variation of temperature and pressure will be given. Some data on the equilibrium condition by which oxygen is either added or removed from carbon black are included.

Applications of Dunn's Equation to the Study of Rubber.

W. F. Busse and E. Karrer. (39 *minutes*)

It is shown that the reversible changes of viscosity with temperature for rubber solutions of various concentrations in eight different solvents may generally be represented by the equation—

$$\frac{\log l}{n} = \frac{A + B}{T}$$

derived by Dunn for pure liquids. This holds even where the change of viscosity with temperature is relatively much different for the solution and the solvent. Some inferences, from these results, relative to the structure of rubber are indicated.

The reversible changes of viscosity with temperature are probably less dependent upon a change in the polymerization of the rubber than upon a change in the thermal energy of the molecules. The irreversible changes caused by milling, heating to higher temperatures, exposure to light, etc., may be interpreted from the changes in the constants of the viscosity equation.

A Simplified Type of the Goodrich Plastometer.

E. Karrer, J. M. Davies and E. O. Dietrich. (30 *minutes*)

A description of a simplified type of the Goodrich plastometer, developed for research and control, is given. The complete instrument consists of (1) an anvil upon which the test piece is mounted, (2) a loading plate through which compressive forces are applied by means of (3) a loading tube and weight, (4) a gauge for indicating the height of the test piece during compression and recovery, (5) a furnace for maintaining constant temperatures up to 150° C., (6) a cutter for the preparation of the test pieces. Compression and recovery intervals are equal (30 seconds).

Softness, retentivity, and plasticity are calculated from the values of the initial height, h_0, the compressed height, h_1, and the recovered height, h_2, according to the following equations:

$$\text{Softness, } S = \frac{h_0 - h_1}{h_0 + h_1} \quad \text{Retentivity, } R = \frac{h_0 - h_2}{h_0 - h_1}$$

$$\text{Plasticity} = S \times R = \frac{h_0 - h_2}{h_0 + h_1}$$

Typical plasticity data for crude and compounded rubber, including temperature coefficients, are represented. The relation between softness and retentivity for a large number of stocks is pointed out, and the effects of departures from standard testing conditions are discussed.

A Method for Estimating the Degree of Penetration of Rubber Into Fabric.

E. O. Dietrich. (7 *minutes*)

To examine the extent of penetration of rubber compounds into fabrics, the composit rubber-cotton structure is first cured to the hard rubber stage by the use of polysulfides. After sectioning, the cotton fibers are dissolved by means of concentrated sulfuric acid, leaving the hard rubber matrix which may be studied microscopically. Typical photomicrographs of a number of fabrics are shown.

Rate of Cure of Reclaimed Rubber. II.

F. L. Kilbourn, Jr. (31 *minutes*)

In a previous paper from this laboratory (Shepard, Palmer, and Miller, Ind. Eng. Chem., 20, 143 (1928)) data were presented which indicated that alkali added to a "water-cooked" reclaim to the extent that it is present in an "alkali-cooked" reclaim, did not bring the rate of cure of the water-cooked reclaim up to that of the alkali-cooked. On the basis of these results the conclusion was reached that the alkali content of reclaim was only partially responsible for its rapid rate of cure.

The work recorded in this paper covers additional data on this point. Extraction of alkali-cooked reclaim with water for a period of sixty days extracted three times as much alkali as was found by the ordinary alkalinity control test (four hours). Adding this amount of alkali in gylcerine as a carrier to water-cooked reclaim brought the rate of cure up to that of the alkali-cooked.

Thermodynamics of Stretching of Vulcanized Rubber.

Roscoe H. Gerke. (23 *minutes*)

The first and second laws of thermodynamics are applied to the stretching of vulcanized gum stocks. Stress-strain curves for rubber usually exhibit considerable hysteresis, which preclude the application of the second law.

A method of obtaining reversible or equilibrium stress-strain curves is described which makes possible the application of the second law. These stress-strain curves are identical for different cures, whereas the usual curves make the rubber appear stiffer with increased cure. This is an additional link in the evidence that vulcanization affects the plastic properties to a greater extent than the elastic properties. The equilibrium stress-strain curves show the rubber to be stiffer at higher temperatures. This is in qualitative agreement with the second law. The stress-strain curves which show the rubber to be stiffer at lower temperatures are not compatible with the second law.

The suggestion has been made that the retraction of stretched raw rubber is analogous to production of work by steam expanding in contact with water. This analogy has been found to be true for vulcanized rubber. Heat is absorbed not only due to the work done by the rubber but also due to the energy absorbed in retraction.

Flexing Test for Tire Carcass.

W. A. Gibbons. (22 *minutes*)

A description is given of the laboratory flexing test as applied to tire carcass materials. The preparation of samples, methods of curing, and details of testing are discussed. In order to obtain reliable results the weight and gauge of skim coat, compression produced by cure, as well as the mechanical details of testing must be kept constant within certain limits.

Fabrics Used in Rubber Belting.

J. E. Skane. (30 *minutes*)

No abstract received.

Description of VANDERBILT LABORATORY and Its Equipment

[Completely Equipped Laboratory Makes Possible Almost Every Kind of Testing on Rubber]

Top View shows the Vanderbilt laboratory as seen from the railroad Bottom View shows the building from the street

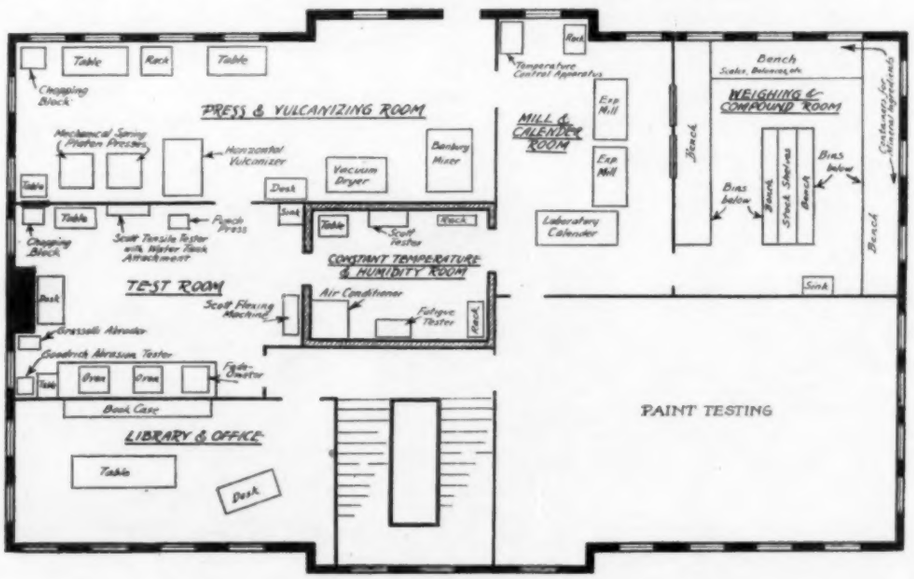
OUTWARDLY, the new testing and research laboratory building of the R. T. Vanderbilt Company at East Norwalk, Conn., is not unlike a modern school in beauty of appearance. Once inside, however, this idea is immediately dispelled, for the visitor is at once confronted with a mass of equipment and machinery seldom seen in any one similar building in the rubber industry.

Almost every kind of testing device and machine used in rubber testing and research is to be found in this completely equipped laboratory—tensile, fatigue and abrasion testers, ovens, fadeometer, platen and horizontal presses, vacuum dryer, enclosed mixer, large and small size mills, oxygen bomb, calender, refrigerator and compressed air equipment, high and low pressure boilers, and other equipment to make it an admirably suited laboratory for all testing purposes.

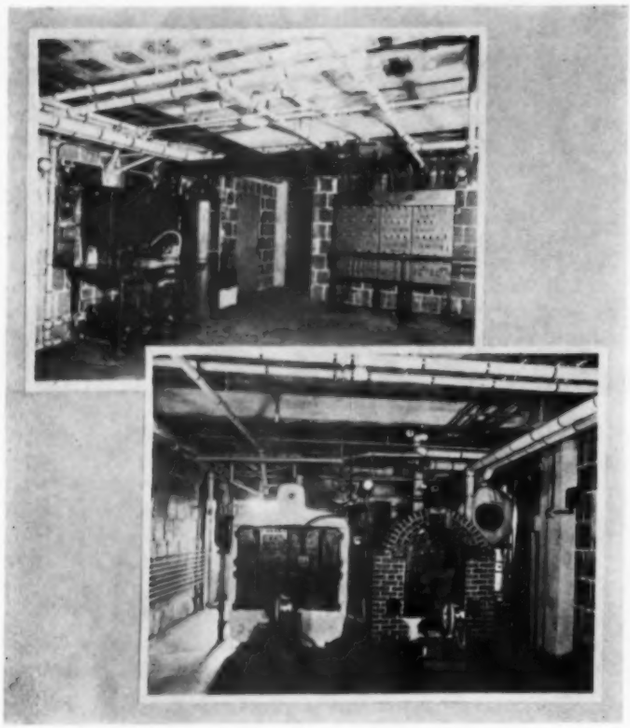
Located adjacent to the N. Y., N. H. & H. railroad tracks and one mile from the South Norwalk station, the Vanderbilt laboratory is reached from New York by train in approximately one hour. The building is of brick construction, three stories high, and approximately 45 by 78 feet in size, located on two acres of ground.

On the ground or basement floor is located the machinery for the operation of the building, such as the boilers, water supply, electrical equipment, refrigeration, compressor and heavy machinery in connection with the testing of rubber and other materials, such as paint and pottery. This floor also contains a locker room, wash room, stock room, vault for records, garage and oxygen bomb room. The building is heated by a vapor heating system consisting of an automatic oil-fired, low pressure boiler, which maintains a temperature of 70 degrees F. whenever the outside temperature is below this mark. The oil burner on this heater is thermostatically controlled. The other unit of this equipment is an automatic oil-fired, high pressure boiler for supplying heat for vulcanizing and other processes. It also supplies heat for the hot water supply throughout the building. At such times as this boiler may not be in operation, a Bryant auxiliary gas-fired boiler is available. The heavy rubber mill (Farrel), 16 by 42 inches, is also located on this floor. This is used for making master batches of rubber. For supplying compressed air to all departments, a Hobart compressor is used. This is equipped with reservoirs for supplying air at 150 pounds and also at 15 pounds for operating the Tagliabue temperature controllers.

Adjacent to the air compressor are the refrigerating compressors and coolers for the humidifying equipment. This consists of a pair of Frigidaire compressors and Bilt-Rite water cooler for dehumidifying when the outside humidity conditions are higher than desired. At one end of this floor is located a spacious garage, large enough to



***PLAN** of the second floor where most of the rubber testing is done. Note that the room arrangement allows for a logical flow of work from room to room without any wasted motion*



TOP—Frigidaire Equipment, Air Compressors and Switchboards
BELOW—High and Low Pressure Boilers

accommodate eight cars. At the other end, on the basement level but not connecting with it, is the transformer vault and bomb room. This room is practically built in an embankment and reached only from an exterior entrance. The Bierer-Davis bombs are especially built with a capacity for seventy-two samples each and are provided with special safety discs for preventing the pressure from rising above 400 pounds. In case of explosion, or rise in pressure above 400 pounds, provision is made for carrying off the gases from the bomb by means of jointless brass tubes leading to the outside of the building. The oxygen pressure and the bath temperature are equipped with Tagliabue indicating and recording instruments. The bomb room is provided with a partition to protect the operator while the bombs are under pressure. The heat for the bomb bath is supplied by a gas-fired household size Ruud water heater.

On the floor above, or main floor, are the office, library, weighing and compounding room, mill and calender room, press and vulcanizing room, test room, constant temperature and humidity room, and space for the paint testing department. It is on this floor that practically all of the work on rubber is done, with the exception of the chemical work, which is taken care of on the floor above, and the outdoor aging tests, which are conducted on the roof.

The space on this floor has been planned and laid out so that work in process proceeds logically from one room to the adjacent one, as shown on the plan of this floor on the previous page. In the far corner is the weighing and compounding room (17 by 19 feet) equipped with benches (with bins underneath for rubber), scales and balances for weighing ingredients of rubber batches, containers, etc. Mineral compounding ingredients are kept in ordinary bread boxes with pivoted rounded tops, a storage system which has been found very handy and effective.

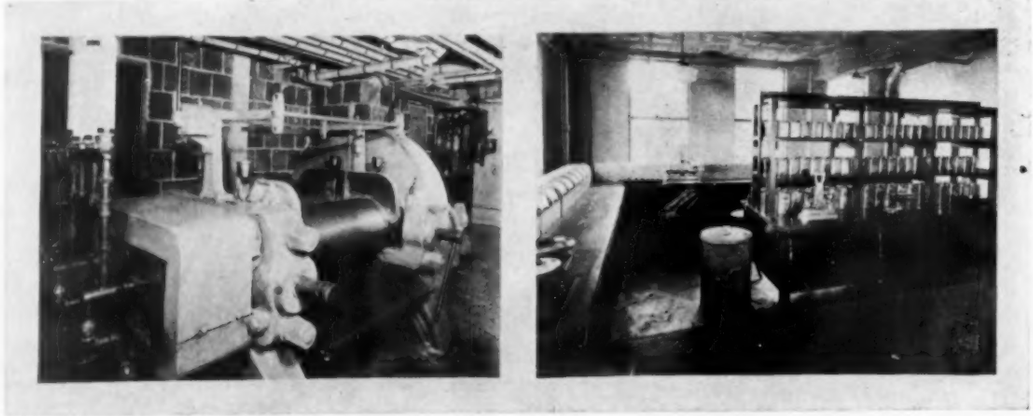
In the partition separating this room from the adjacent mill and calender room are two windows through which weighed batches are passed to the mill operators. This room (14 by 19 feet) contains two Farrel 6 by 13 inch laboratory mills equipped with variable speed A. C. motor and constant temperature control and a 6 by 13 inch 3-roll Farrel laboratory calender with all adjustments for sheeting and frictioning. The constant temperature control apparatus (Schutte & Koerting Company) located in this room consists of a circulating pump and controlled valve with a tank as a reservoir for the water to be circulated, the total quantity of water being variable. The temperature is maintained by an electrical control operating the valves. The controlled temperature water furnished by this apparatus is supplied to the mills, calender and Banbury mixer in the adjacent room.

From this point, the stock may go either directly to the vulcanizers or into the humidity and temperature control room. The press and vulcanizing room contains a Banbury mixer, vacuum dryer, two platen presses, a horizontal vulcanizer, chopping block, racks, tables, etc. The laboratory size Banbury[1] is used for special mixing and is equipped with sealing devices for vacuum attachment so that liquid as well as plastic mixes may be made. It handles a four-pound batch of rubber and a somewhat larger quantity of 1.50 gravity mixed stock. The Stokes vacuum dryer used is a small commercial size (3 by 3 feet) instead of the usual laboratory model. The vacuum pump of the dryer is capable of exhausing down to within 1/10 inch of mercury and is used for supplying the vacuum for the Banbury.

The platen presses are newest model 75-ton Terkelsen mechanical spring presses[2] with 24-inch square platens electrically opened and closed. An electric motor, operating through a train of gears to a rack pressed into the lower bed brings into action four powerful springs acting as an accumulator, and which maintain the pressure, during which

[1]See THE RUBBER AGE, May 25, 1928, Pg. 157, for full description.

[2]See THE RUBBER AGE, June 25, 1928, Pg. 323, for full description.



LEFT—Farrel 16'x42" Mill

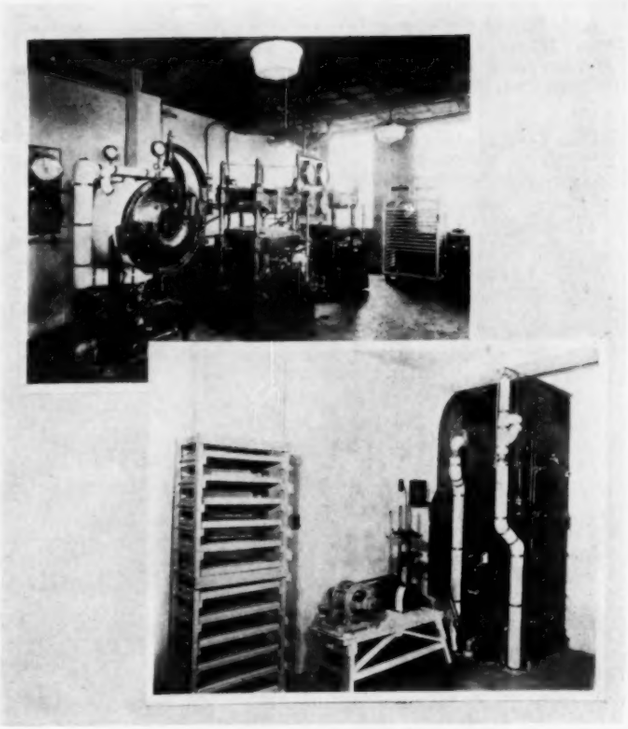
RIGHT—View in Weighing and Compound Room Showing the Methods of Storage, Benches, Scales, etc.

time the motors are not used. These presses are equipped with toothed racks which exert the same force downward as upward instead of the usual ram of hydraulic presses. It is thus possible to open the molds after curing by the same force which closes them. Both halves of the molds are attached to the platens with tracks or guides which hold the molds in position so that they are not removed from the press between cures. Presses of this construction are of special advantage in laboratories or plants where it is desirable to eliminate high pressure water.

The horizontal open steam vulcanizer (Adamson) is equipped with a quick closing head and is jacketed and provided with steam coils and compressed air so that air cures at atmospheric or higher pressures may also be made in it. The vulcanizing equipment is all equipped with air operated Tagliabue controllers, indicating and recording thermometers.

In both the mill room and vulcanizing room, especially designed racks are used. These racks are for storing and the transportation of mixed rubber stocks and were designed to facilitate the movement and storage of milled rubber. They consist of trays with screen bottoms to permit free circulation of air on both sides of the rubber. A special feature of the construction of these racks is the trays which are mounted in U shaped tracks which allow the trays to be drawn out part way for the removal of stock without fear of the trays tilting downward to a dangerous angle.

The testing room is adjacent to the vulcanizing room and is fully equipped for abrasion, aging, tensile, flexing and fading tests. It contains a Grasselli abrader, Goodrich abrasion tester, two large electric aging ovens, a Scott flexing machine with water tank attachment[3], and a Fade-Ometer[4] for making artificial sunlight fading tests. This equipment is all well-known to the rubber industry and has been described in these columns from time to time. The Scott tester with water tank attachment was specially built for this laboratory but is now available for general use. It makes stress strain tests at varying temperatures. The rubber test piece can be stretched in water at any temperature between boiling and freezing, arrangement being made for refrigerating and electrical heating attachments. Records are made graphically on an autographic recorder or visually on the graduated dial. It is approximately 15 feet in length, with the water tank attachment 48 inches long. The Fade-Ometer, for testing the fading properties of vulcanized rubber samples, uses the violet carbon arc which is said to give results in line with tests of practical uses of rubber goods. The rubber sample can be placed in tension if desired and by the addition of a fan for air circulation and temperature control and adding a water supply for humidity control, even delicately colored rubber or fabrics can be tested with excellent results.



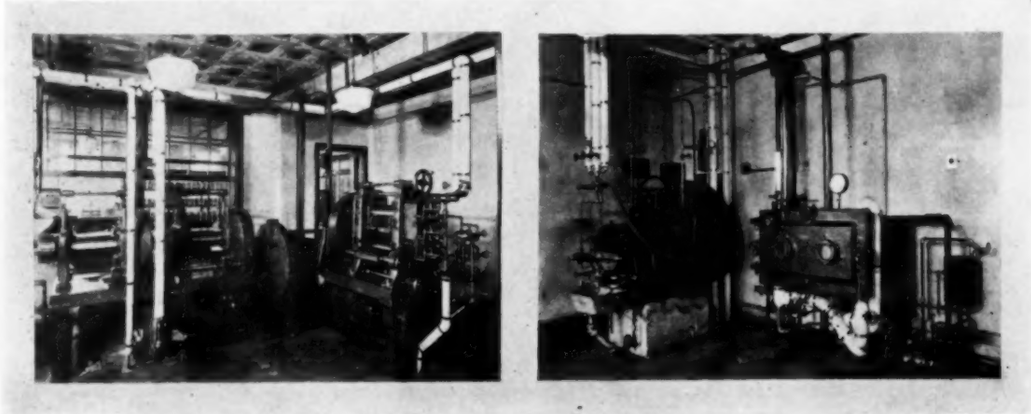
TOP—View in Vulcanizing Room Showing Horizontal Vulcanizer, Mechanical Spring Presses and Rack. BOTTOM—Unit Air Container and Fatigue Tester

The constant temperature and humidity room contains a latest type quick return Scott rubber tester. This tester is standard throughout the industry and is most generally used for tensile tests. In this room is also the Carrier unit air conditioner[5] which keeps the temperature and humidity constant. This air conditioner has a capacity of 2500 cu. ft. of conditioned air per minute and is operated by a small motor. Water from a reservoir is drawn up and discharged in a dense spray. Air is brought into contact with this finely atomized water, freeing it from dirt and saturating it at the temperature of the spray. This saturated air, after being heated to the proper temperature, is then discharged

[3]See THE RUBBER AGE, March 25, 1929, Pg. 673, for full description.

[4]See *"The Testing of Rubber Goods for Sunlight Effect,"* THE RUBBER AGE, April 25, 1928, Pg. 75-76.

[5]See THE RUBBER AGE, March 25, 1928, Pg. 681, for full description.

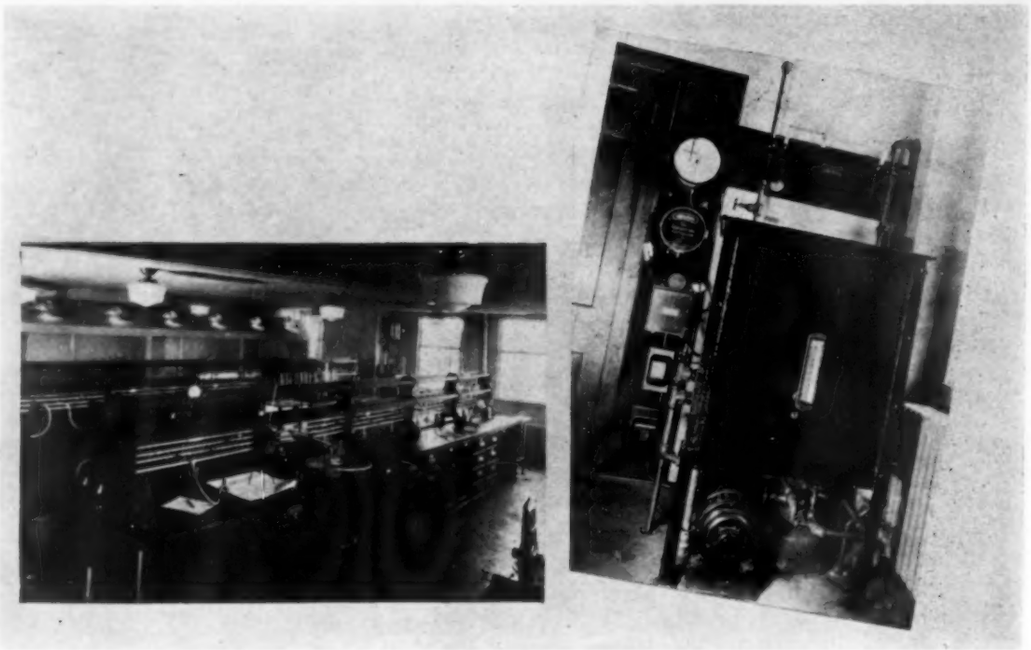


LEFT —Laboratory Mills and Calender with Variable A. C. Motor

RIGHT — Banbury Mixer and Vacuum Dryer

LEFT—View of Chemical Laboratory on Top Floor. Note Hood in Background with Illumination through Top

RIGHT—Constant Temperate Control Apparatus for Water



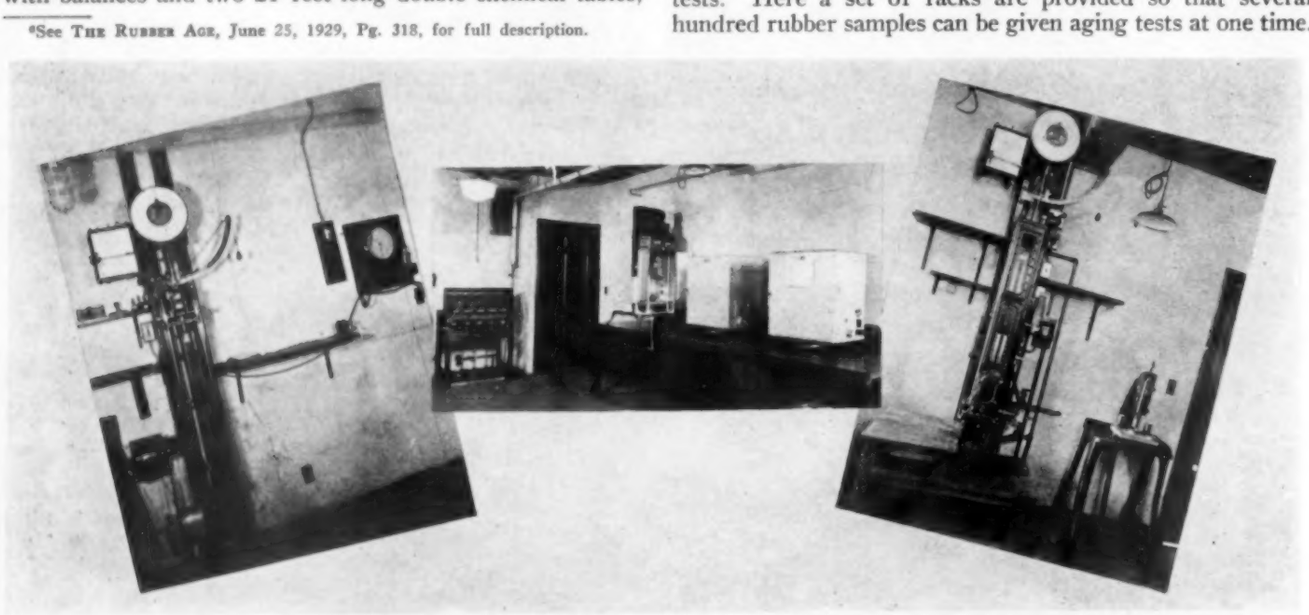
into the room through the upper part of the cabinet. Hot water is used in the heater coils, since the supply of this is maintained constantly day and night throughout the year. A Tagliabue recording psychrometer on the opposite wall records the existing conditions. A hygrometer, attached near the psychrometer, controls the humidity conditions and a sylphon bellows controls the temperature.

A DeMattia fatigue tester[6] is also a part of the equipment of this room. This machine is usually used for dynamic testing with pieces of cured rubber. The samples are tested for elongation, tensile or flexing strength by extending and releasing it continuously at a predetermined speed, to the point of breaking.

On the floor above, the third floor, is the chemical laboratory in addition to several rooms for paint and pottery testing. A private office for Dr. Paul I. Murril is adjacent to the laboratory and a chemical store room is also provided. The chemical laboratory consists of a balance table with balances and two 21 feet long double chemical tables, one with a sink on each end; one 24 foot long wall table with a sink in the middle and one 22 foot long hood.

The hood is made of asbestos stone built in the Cornell design. Illumination is through glass windows in the top, with lights reflecting downward. An adequate blower is provided to carry the fumes off above the roof. The chemical tables and hood are equipped with cold and hot water, electricity, gas, steam and air. A steam heated still provides distilled water. An adjacent electrical testing laboratory consists of constant temperature ovens for aging samples under test and a transformer going up to 100,000 volts with instruments for measuring dielectric constant, resistivity and power factor. Other apparatus for testing of oil is located in this room. On this floor also are located toilets, showers, and two bed rooms for use of laboratory workers who need to run 24 hour tests. The roof is reached through a pent house and is a flat surface with a parapet wall so that it is well adapted for weathering and exposure tests. Here a set of racks are provided so that several hundred rubber samples can be given aging tests at one time.

[6]See THE RUBBER AGE, June 25, 1929, Pg. 318, for full description.



Photos show (LEFT) the Scott Tester in Constant Temperature and Humidity Room (CENTER) Scott Flexer, Fade-Ometer and Aging Ovens in Test Room (RIGHT) Scott Tester with Water Tank Attachment, and Punch Press in Test Room

No. 4 of a Series of Articles on the

Uses of RUBBER in Modern Aircraft

Rubber *in* Lighter-Than-Air Craft *and for* Safety *and* Comfort *in* Modern Aviation

By JOHN F. HARDECKER

Chief Draftsman, U. S. Navy Aircraft Factory, Philadelphia, Pa.

THERE is an exact distinction between the airplane and the airship. The airplane is aero-dynamic, that is, the airplane rises into the air by the forward thrust of its motor driven propeller and the pressure of the air driven against its wings. If the engine stops, the airplane must glide to the ground and make a landing. The airship is partially aerodynamic in that its motors and great fins in the tail give it a measure of altitude control, but primarily it is aero-static—that is, it rises in the air because it is actually lighter than the air in which it floats. The airship continues to remain aloft even if its motors are shut off. The airplane has its advantages for the short fast trip, while the large airship secures its fullest efficiency when operated over long distances.

In the manufacture of all types of lighter-than-air craft, balloons, non-rigid airships, semi-rigid and rigid airships, rubberized balloon cloth plays a major role. The cells which hold the gas, helium or hydrogen, are constructed of rubberized balloon cloth. Elastic cord is used to shut and keep tight the valves on lighter-than-air craft. Rubber rings are used around balloon baskets to keep them afloat if landed on water. Water ballast containers on airships are often constructed of rubberized balloon cloth. Since rubberized balloon cloth serves such an important function in all lighter than air activity, a brief summary of its manufacture should be of prime interest.

Manufacture of Rubberized Balloon Fabrics

The rubber used in the manufacture of rubberized fabrics for use in aeronautical work, is either pure Para or plantation rubber free from dirt and impurities. After the rubber has been thoroughly treated and properly mixed, it is taken to the spreader room where it is ready to be applied to the rollers of the spreading machine.

The cloth used in the manufacture of rubberized balloon fabrics, is a very good grade of cotton, free from knots, slubs, weaving imperfections, etc. Before the cloth is sent to the spreader room it is given two inspections in the fabric inspection department, the first one being on the measuring table, and the second one on the pick inspection table. The first inspection is for the general appearance of the cloth and for removing test samples from each piece. Cloth failing to meet the requirements for general appearance or failing in the weight or break test is rejected and returned to the manufacturer. Cloth meeting the requirements of the first inspection is accepted and placed on the pick table for the second inspection. On the pick inspection table all knots, slubs, heavy thread, etc., are removed so that when the cloth passes over the spreader the entire surface will be rubberized, leaving absolutely no portion of the cloth without a film of rubber. After the cloth has been inspected on both sides over the pick inspection table it is ready to be sent to the spreader room for rubberizing.

On the spreading machine each ply of cloth is treated separately. The rubber coating is applied in very thin layers, a single ply of cloth being given many passes over

Goodyear "Puritan" Airship
Envelope Made of Two Ply Rubberized Fabric; 1 Ply Straight and 1 Ply Bias

NOTE: *The first of this series of articles appeared in* THE RUBBER AGE *of August 10th. The second and third were in the issues of September 10th and 25th, respectively. The above is the concluding article of the series.*

the spreader in order to obtain the desired weight. When a roll of cloth is to be used for bias ply, after it has been treated it is cut into lengths equal to the width of the fabric at an angle of 45 degrees. These pieces are turned and assembled by the original selvage edge, the lap being about three-fourths of an inch.

When a multi-ply fabric is to be made, after each individual ply is made up it is taken to a doubling machine, where the plies are doubled together. After the single ply is treated, or if it is to be a multi-ply fabric, after the plies have been doubled together, the fabric is ready for curing and is rolled on a drum and placed in a chamber and given the proper cure with steam heat. After the fabric is removed from the curing drum, it is finished and ready for test. Weight and break test pieces and diffusion samples, if such are required, are removed from the rolls and tested, and if these samples pass the requirements of the specification the cloth is ready to be fabricated into aeronautical products.

Safety and Comfort

In safety adjuncts to aviation, such as parachutes, life jackets, life rafts, goggles and even waders, rubber is an important ally. When it comes to such matters as cushions, mattresses and the fit of goggles, rubber again plays a significant part. Somehow, no matter what the particular phase of aviation under consideration at any given time may be, rubber just naturally is found doing its share in assuring success.

Parachutes

In the parachute rubber finds two significant uses. It is used for the vent ring which is placed in the center of the parachute, and which by expansion and contraction, dependent upon pressure, regulates the flow of air out of the parachute. It is three inches in diameter, with a circular cross section of .154 inches, made of pure para rubber. The rubber strand of the ring must have a breaking strength of seven pounds. The elongation must be at least 700 per cent, with prompt and complete restitution.

Back and Parachute Pack Cushion

The other important function of rubber in the parachute is in its use in the elastic exercises chord which releases the parachute from its pack when the rip cord is pulled. This is a special three-sixteenths inch diameter elastic chord, made of multiple strands of rubber tightly incased within a layer of cotton braid. The rubber is a compound containing not less than 90 per cent of the best wild or plantation rubber.

The physical requirements are as follows:

Load for 100 per cent extension...	7-10 pounds
Breaking load (minimum).....	35 pounds
Elongation of braid (minimum)...	180 per cent
Tolerance on diameter.....	1/64 inch

Pneumatic Airplane Accessories

Pneumatic airplane accessories, generally referred to as air-rubber products, aid greatly in the comfort, convenience and safety of both pilots and passengers. They are made of strong light weight fabrics with a high grade rubber coating inside. The rubber, which is the essential part of these products, is thus protected from hard wear, while it at the same time holds the air and resists moisture. These products are all fabricated by vulcanizing, there being no patching, sewing or cement used, as even the valve is vulcanized in. These products include seat and back cushions, parachute back cushions, life jackets, mattresses, etc.

Pneumatic Airplane Cushions

Pneumatic airplane cushions are made to fit the usual bucket seats of open cockpit planes, and also for both the pilot and passenger seats of closed planes. They are available in the form of separate seat and back cushions, or an interchangeable body fit cushion, and also a special cushion for parachute packs. They are resilient, conform and give to the movements of the body and are well ventilated. They are strong enough for a great amount of wear and tear; will not stretch, pack down nor lose their shape. They are easily inflated with a few breaths of air. These cushions may be strapped to the seat as plane equipment or deflated and conveniently carried as personal property.

Bodifit Cushion

They are usually made of special khaki jean or corduroy, rubberized inside. After cutting out, the materials are placed in a mold along with the valve. Under great pressure, they are vulcanized together. At the same time the vulcanizing forms all seams, and seals everything, including the setting of the valve. The cushion becomes one integral vulcanized fabric, with the air chambers shaped to give it the desired form when inflated.

Pneumatic Safety Accessories

Pneumatic life jackets, for use of passengers and crews on air lines flying over water, provide excellent safety insurance. When worn deflated, the wearer practically forgets he has it on, as it only weighs 19 ounces. There are two separate double air chambers and two valves; two blows fill each pair.

In order to give some detailed conception of the material and requirements of these pneumatic accessories, the following details are abstracted from the Navy specifica-

Pneumatic Life Jacket

ons for pneumatic life jackets. The material used shall e the best quality khaki jean weighing 2.85 ounces per quare yard and counting 96 strands per inch of warp and 4 strands per inch of filler. It shall be coated on the inside ith rubber to a total thickness of rubber and fabric of .032 nches. All seams in the jacket shall be molded and cured under pressure forming a reinforcing bead of rubber along the inside edge of the seam.

The pneumatic life raft also has a distinct place in airplane equipment for long flights. Commander Byrd's use of it on his trans-Atlantic flight, when fog and storm forced him down off the seacoast of France, has vividly impressed on all of us the value of such precaution. In the recent national balloon race, E. J. Hill also found real use for it when his balloon came down in the wilds, and he used his collapsible life boat to reconnoiter the surrounding territory preparatory to trying to find his way back to civilization.

The Navy Department specification for inflatable life rafts lists three sizes, for one, three and five men. It specifies that the fabric used in the construction of the tubes shall be rubberized airplane cloth. The fabric is to be rubberized on both sides with three coats of a high grade rubber compound containing not less than 66 per cent rubber, to a finished weight of 18 ounces per square yard. The bottom is made of a similarly rubberized 10-ounce duck, and cemented to the under side of the tubes.

Pneumatic Mattresses

With the advent of large passenger planes operating on regular schedules and carrying upward of twenty passengers, the demand for sleeping or lounging accomodations aboard these "pullmans of the skies" has grown. Pneumatic mattresses and pillows, due to their light weight and extreme comfort, are finding an ever increasing use.

Airplane Goggles

Rubber plays a very significant part in the construction of pilot's and observer's goggles. The best type of goggles are equipped with a sponge rubber mask or cushion. Being unusually soft, resilient and springy, it adjusts itself perfectly and in air-tight fashion to the contour of the face, thus preventing the cold air from seeping in and protecting the eyes from draughts. Because of this excellent fit and the natural friction qualities of sponge rubber, the goggle clings lightly in the position it is placed, and does not roll or slip even in the air stream of tremendous speeds.

The soft light cushion makes the goggles unusually comfortable and frees the wearer from all sense of annoying pressure around the eyes, even when worn for long sustained periods. The sponge rubber obviates any tendency toward sinus trouble, which may be caused by undue pressure on sensitive parts of the face. As these rubber masks are set well apart from the eye area, the mask does not enter the field of vision at any angle. Unquestionably, there is no other material in existence which could perform the functions of sponge rubber in an aviation goggle.

Aviation Waders

Aviation waders are worn by the land crew in launching and docking seaplanes. They are in reality waterproof wading pants extending to the armpits and are adjusted to the body with adjustable shoulder straps. They are made of heavy mackintosh cloth, with rubber cemented seams suitably reinforced.

Conclusion

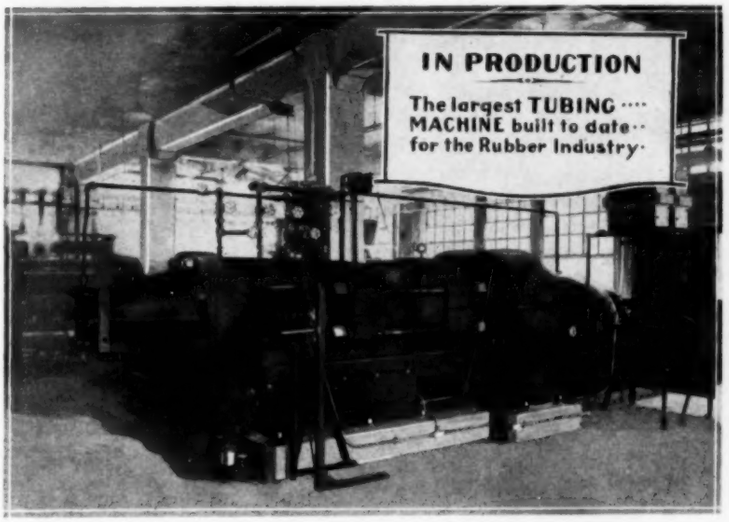
This concludes the story of rubber in modern aviation. Astounding as the multiplicity of uses of rubber in aircraft here may be, of far greater significance has been the close cooperation extended by the rubber industry to the aircraft industry in developing these applications of rubber to the specialized needs of aviation, and the research now going forward in laboratories which will in due course develop even new and greater applications.

PROGRESS!

Recent development by Adamson engineers of a giant 16-inch tubing machine is symbolic of the alertness of our engineers and the progress being made by this company in the rubber machinery field.

This tubing machine, the largest made to date for rubber industry use, is now being successfully operated in one of the larger Akron companies.

It is used for tubing solid tires and has a capacity of 23,000 pounds of rubber per hour at a speed of 20 R. P. M.



The above photo shows the record-size tuber in operation. It occupies a space 21 feet long exclusive of die head; is 6' 4" wide and 5' 3" high and is built for a speed range between 15 and 30 R. P. M.

The ADAMSON MACHINE CO.

AKRON, O. **RUSSELL B. KOONTZ, *Pres., Gen. Mgr.***

The Rubber Scrap Market in England

THE consumption of reclaimed rubber in Great Britain has increased considerably during the last few years, according to Harry A. Scott, Canadian Trade Commissioner. The rubber restriction scheme gave an added impetus to the reclaiming industry, and during the period of high prices for crude rubber a number of manufacturers became familiar with the use of the reclaimed product to such an extent that it has now developed a more established outlet and the former prejudice against its use has been largely overcome.

As a result of this growing market for reclaimed rubber, when the heavy decline in crude rubber took place in 1928, although it is generally agreed that there was a certain falling off in reclaimed, it was not nearly as marked as was anticipated—in fact, one or two firms consulted stated that the demand for reclaimed rubber actually increased last year.

To fill the requirements of producers of reclaimed rubber, several of whom are located in the north of England, it is necessary to import considerable quantities of certain classes of rubber scrap, the most important source of supply being the United States.

In Great Britain there are available large surplus supplies of old pneumatic outer casings, and there would seem to be little opportunity of importing this class of scrap in view of the high cost of transportation on such a low-priced article, plus a better demand in the United States.

There are conflicting opinions as to the prices obtainable for old outer casings; values are from £4 to £4 10s. ($19.50 to $22) per ton of 2,240 pounds delivered to factory. Early in 1928 old outer casings were obtainable at £3 ($14.60) per ton. These and old bicycle tires are available in large quantities from domestic sources, and it is understood that practically none have been imported from the United States during recent years. Ordinary rubber waste such as hosepipe, black mechanical scrap, etc., is also available in such quantities that importations would not be profitable.

The main imports from the United States consist of inner tubes, which are in constant demand owing to lack of sufficient supplies in this country. These are of several types, red tube being the most important, but prime floating and compound tubes are also shipped to England by American firms.

The American red, being an oxide tube, is not as valuable in the opinion of British reclaimers as the English red antimony type, as the oxide variety cannot be bleached. Consequently, it does not bring as good a price as the domestic article. Red oxide tubes from the United States are nevertheless imported into England in large quantities. Recent quotations on American red tube scrap were approximately £25 per ton c.i.f. Liverpool.

Compound or gray tubes from the United States, imports of which fluctuate according to available supplies, generally bring from half a cent to one cent per pound less than the red variety. The most favored American scrap is the prime floating tube, is the hardest to obtain, and was recently quoted at around 8 cents per pound c.i.f. Shipments of tube scrap from the United States are usually made in press-packed bales or large bags.

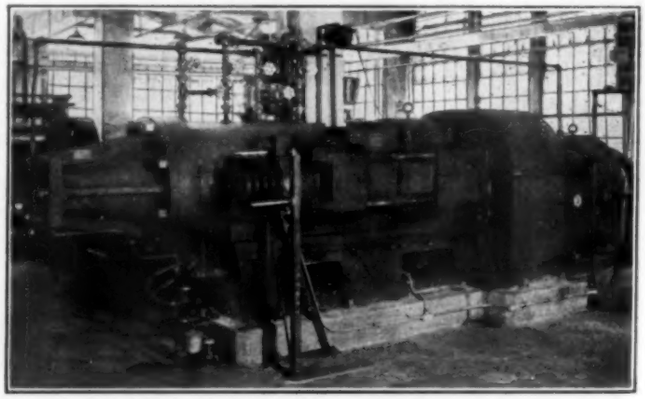
In addition to tube scrap, which is by far the most important item shipped from the United States, there is also a considerable demand among English reclaimers for certain other scraps not so readily obtainable in Great Britain, such as thin bathing-cap waste, pink corset trimmings, toy balloon waste, tire flaps, goloshes, etc. American bathing-cap waste, which is favored over other sources, was recently quoted at around 5 cents per pound c.i.f. United Kingdom port for all new manufacturers' scrap: pink corset trimmings, without cloth, 5 cents per pound, and with cloth 3 cents. The current market value for tire flaps is about £5 ($24) per ton delivered to works. Goloshes scrap as a rule is more competitive from Scandanavia than North America, and is worth about £6 10s. ($31.50) per ton delivered. Toy balloon scrap is worth roughly 5 cents per pound c.i.f.

The Largest Built Tuber

A 16-INCH tubing machine, the largest tubing machine ever built for use in the rubber industry, has recently been set up in one of the Akron rubber companies by the Adamson Machine Company, Akron, O.

This exceptional tubing machine is to be used for running solid tires. Developed in the shops of the Adamson company, it is one of the last achievements of the late Alexander Adamson, founder of the company.

Preliminary tests run on this tubing machine indicate it has a capacity of 23,000 pounds of rubber per hour at 20 r. p. m. It occupies a space 21 feet long, exclusive of the die head and is 6 foot 4 inches wide and 5 feet 3 inches high. The tuber is equipped with a Rollaway self-aligning thrust roller bearing and has an especially designed screw which makes the feeding automatic. The gears are enclosed in an oil tight case with force feed lubrication to all bearings being furnished by means of a pump. It is driven by a 250 horsepower D. C. motor and has a range of operating speed between 25 and 30 r. p. m. The cylinder in the new tuber is bushed and water-jacketed to permit easier cooling of stock. The screw is also cored and fitted with inside piping.



Although but one of the 16-inch machines has been built to date, the Adamson firm already has inquiries from another of the larger Akron rubber companies for a similar type machine to be used in massing rubber. The Adamson Machine Company builds tube machines and strainers in all sizes between this large model and the 2-inch screw. They also specialize in the manufacture of hydraulic presses, mills, calenders and operate an up-to-date iron and steel foundry. Russell B. Koontz is president and C. L. Fenn, secretary-treasurer of the firm.

The second meeting of the Akron Group of the Rubber Division, A.C.S., will be held in the Knights of Columbus Club, Akron, on the evening of October 14. The program will deal with problems relating to the design of tires.

EDITORIAL COMMENT

Servicing the Industry

THE slogan that "Service Sells" has been no more thoroughly demonstrated than in the case of the suppliers to the rubber manufacturing industry. "Servicing" an industry is a comparatively new wrinkle in industrial merchandising and was a long time developing. It was, at first, a highly expensive proposition, but the far-sighted concerns who took it up soon found that the returns had fully warranted the experiment. Today the rubber manufacturing plants are no longer dependent on the work of their own chemical staff and laboratories, but a great deal of experimental work is being done for them indirectly, and on which they have reaped great benefits, by the highly efficient scientists of the suppliers of raw materials, working in laboratories as completely and perfectly equipped with the most efficient and up-to-date instruments and apparatus as in any industrial plant in the world.

Not only have these chemical staffs of the suppliers to the rubber industry worked hand in hand with the scientists of the individual plants on specific problems, but they have developed many new angles in rubber technology through independent research, and through the exchange of views and through the splendid media of local group meetings of the Rubber Division of the American Chemical Society, they have contributed an invaluable amount to the literature on the subject.

That "service sells" in the rubber industry is proven by the fact that the industry is no longer seeking to control sources of supplies of raw materials but is content to take the products of present suppliers, knowing them to be the result of the most efficient scientific tests and composed of the highest quality.

What Value Predictions?

THE prognosticators within the rubber industry are beginning to find their second wind and are hurrying to catch up to the goals set by the consumption and production figures of crude rubber over the last nine months. In every case these prophets lagged far behind with the figures they set at the first of the year. It will be remembered that the most optimistic of them stated that consumption for the world during 1929 would reach but 730,000 tons and that production would only reach 769,000 tons. Exports from principal producing countries, which are usually taken to indicate production, during just the first eight months have already totaled 565,700 tons, which would represent, if this rate continues throughout the year, a total of approximately 850,000 tons. Net imports to the principal producing countries, which are taken generally as a basis for computing consumption, during the first six months, reached a total of approximately 490,000, which, even allowing for the usual seasonal decline in consumption during the last half of the year, and stocks on hand at the end of the year, would mean a total well over 800,000 tons.

It is interesting to note that THE RUBBER AGE, as early as April 25, 1929, estimated the year's consumption for the world to be 756,000 tons and the production to total 810,000. In the light of the actual figures to date we confess ourselves also behind but we led the field until recently when the conservative British house of Charles Hope & Sons valiantly passed us with a courageous spurt and came out with estimates that consumption for the year will reach and go beyond 820,000 tons and production will go slightly less than 850,000 tons. At the moment we think they will win, but we still cling to second place.

Trade Association Financing

THE various methods of financing the work of trade associations has been made the subject of a bulletin recently issued by the Chamber of Commerce of the United States. The report is based on information furnished by more than 300 trade organizations representing many lines of industry and discloses a great variety of financing methods including uniform or flat rate, rate on volume of business of members, number of employees, pay roll, capital investment and agency rating of members.

Approximately 39 per cent of the associations reporting have adopted a system of financing calling for a fee, based on the volume of business of individual members. The second most commonly used method calls for a uniform or flat rate dues.

It is to be noted that the Rubber Manufacturers' Association is financed by a combination of two of these methods, namely, by the flat basic dues of $50.00 per annum per member and a fee of 2¾ cents per every 100 pounds of crude rubber consumed in manufacture. By this method the burden of expense falls proportionately on each member's shoulders.

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NEWS of the INDUSTRY

Financial—Business
Building Operations
Personals
New Products

SOUTHWARK FOUNDRY IS REACQUIRED BY BALDWIN

The Southwark Foundry & Machine Company, manufacturer of rubber and other machinery, is to be taken over by the Baldwin Locomotive Works, which at one time owned all of its common stock but sold it to officials of the Southwark company several years ago. The purchase will be effected by an exchange of 43,000 shares of new Baldwin stock, worth at current market prices about $2,500,000, for all the capital stock of the Southwark company. Operations will be transferred from Philadelphia to the Baldwin plant at Eddystone, Pa.

The Southwark company was established in 1836 and, it was stated, does an annual business of $3,000,000. Among its products are bead presses, belt presses, belt stitchers, closing presses, cold presses, elevators, flat presses, forged steel molds, sole and heel presses, steam platen presses, tire forcing presses, vulcanizers and doors, hydraulic rubber shears, hydraulic pumps, accumulators, valves, pipes and fittings, hard rubber forming presses, hose presses, pneumatic tire heater presses and rimming presses.

DILL MANUFACTURING CO. TO BUILD LARGER PLANT

The Dill Manufacturing Company, 684 East 82nd street, Cleveland, O., manufacturer of valves and valve parts, has announced the purchase in Cleveland of new and larger factory facilities. The new property consists of more than five acres of ground, and plans are already under way for a new plant that will afford the Dill company many times its present capacity.

Fifteen years ago the Dill Manufacturing Company consisted of a small stamping plant. Today it is considered by many to be the largest farbricator of brass in Ohio. In addition to the valves and valve parts, the Dill company recently added a complete line of air chucks. The introduction of several new products is anticipated when the company assumes its new quarters.

Vanderbilt Co. Entertains

On the eve of the Atlantic City meeting of the Rubber Division of the American Chemical Society, over 40 technical men and other guests were entertained at the new laboratory of the R. T. Vanderbilt Co., East Norwalk, Conn., on Wednesday, September 25th. After a thorough inspection of the laboratory and its up-to-date and efficient equipment, a buffet luncheon was served and the party proceeded to New York in a special car to join the New York Group of the Rubber Division which were proceeding that afternoon to Atlantic City to attend the annual meeting of the Rubber Division.

Returns to America

John J. Watson, president of the Lee Rubber & Tire Corporation, photographed on the *Resolute* on his arrival at New York on September 20 after a business trip to Europe.

CONVERSE RUBBER BUYS HODGMAN DEPARTMENTS

The Converse Rubber Company, Malden, Mass., has purchased the sporting goods and waterproof clothing departments of the Hodgman Rubber Company, Framingham, Mass. This purchase in no way affects the conduct of the Hodgman Rubber Company, which will continue to manufacture at Framingham rubberized fabrics of every kind, rubber sheeting and rubber bands.

The consolidation gives Converse a complete range of sportsmen's waterproof clothing and footwear. The name "Hodgman" will continue to be identified with the products formerly manufactured by the Hodgman Rubber Company, although they will all be manufactured at Malden in the future.

M. L. HEMINWAY, managing director of the Motor and Equipment Association, was elected president of the American Trade Association Executives at their recent annual meeting at Wawasee, Ind.

GOODRICH PLANE STARTS IN FORD AIRCRAFT TOUR

Fifty airplanes representing many of the largest and best known aircraft manufacturers started out from Detroit on October 5 to compete for the Edsel B. Ford trophy in the Ford Reliability Tour. Lee Schoenhair, piloting the Miss Silvertown plane of the B. F. Goodrich Company, is one of the entrants in the tour, which will end at Detroit on October 21, after having touched 32 cities in 19 different states.

The Goodrich ship, a Lockheed-Vega, has a cruising speed of 180 miles an hour and a maximum speed of 210 miles an hour, being equipped with a Wasp motor of 450 horsepower. Because of its speed, the Miss Silvertown will delay its start from each of the 32 airports to be visited until the other planes have had a 30-minute start. Schoenhair will carry a mechanic and one or two publicity men for the tour. The speed of his plane will enable him to pass the other entrants and reach the airports in advance of the other planes.

According to the B. F. Goodrich Company, 80 per cent of the different makes of planes in the tour are fitted with all or part of their tire equipment by Silvertown airplane casings, and the company will, therefore, furnish facilities at each airport on the itinerary for taking care of the needs of the planes.

FIRESTONE FABRIC MILL INSTALLS VACUUM UNIT

The Firestone Tire & Rubber Company has established at its fabric mill at New Bedford, Mass., a new system for handling waste which does away with brushing the cards and keeps the air of the room free from lint. The system cost $50,000 and consists of a vacuum cleaning system that catches up all the lint floating about the room and whisks it away to big tanks in the waste department, where it is baled and sold. With this method, the only part of the card cleaned by brush, as of old, is the revolving flat.

Waste from the flats accumulates on a roller, which is stripped at regular intervals, this stripping being placed on the floor near a vacuum tube. As soon as the valve opens, this waste strip is sucked in and carried away. The system involves an elaborate series of six-inch overhead conveying pipes of steel, a set of nozzles near the floor and of nozzles that can be moved about like those of an ordinary home vacuum cleaner.

Since Firestone took over this plant, formerly Manomet Mill No. 4, the company has spent over $800,000 in improvements, although the plant was supposed to be one of the finest and most modern in the world.

CHICAGO RUBBER GROUP WILL MEET OCTOBER 25

The next meeting of the Chicago Group of the Rubber Division of the American Chemical Society has been announced for October 25 by S. E. Frick, chairman of the newly organized body.

The meeting will be held at the City Club in Chicago and will have "Factory Control Problems" as its subject. Speakers who will present papers on various aspects of this topic will be Messrs. Underwood (Ajax Rubber Company), Kinsley (Dryden Rubber Company) and Cartilidge (Akron Rubber Reclaiming Company).

CITIZENS PLEDGE FUNDS TO MASON TEXTILE PLANT

Merchants and other citizens of Kent and Ravenna, O., are reported to have pledged sufficient funds to assure the establishment of a new industry in the buildings formerly occupied by the Mason Textile Company. The pledges were obtained by the Kent Chamber of Commerce.

A committee of the chamber and J. Harris, owner of the buildings and property, are to confer with executives of the Domestic Electric Company, Cleveland, O., and it is expected that the negotiations will be consummated. It is understood in Kent and Ravenna that the Cleveland concern will purchase the fabrics plant, provided the chamber of commerce assists financially in the initial costs.

The Mason Tire & Rubber Company has denied through its officials that any of its own buildings are to be sold or their activities changed in any way. The tire company is reported as making good progress under its new management.

A. F. TOWNSEND TO HEAD RAYBESTOS-MANHATTAN

Arthur F. Townsend, formerly president of the Manhattan Rubber Manufacturing Company, Passaic, N. J., has been elected chairman of the board of directors of Raybestos-Manhattan, Inc., the merger which includes the Raybestos Company, Bridgeport, Conn., and the United States Asbestos Company, Manheim, Pa. The election of officers took place on September 20, immediately following the formal ratification of the consolidation.

Other officers are: Sumner Simpson of Raybestos, president; H. M. Green of Manhattan, vice-president; George R. Weber and S. R. Zimmerman of United States Asbestos, vice-presidents; F. L. Curtis of Manhattan, treasurer; W. H. Dunn of Manhattan, assistant treasurer; M. F. Judd of Raybestos, secretary, and Hamilton Abert of Manhattan, assistant secretary.

The directors are Townsend, Simpson, Green, Weber, Zimmerman, Curtis, Judd and Clifford Hemphill of Hemphill, Noyes & Co.; Robert W. Atkins of Hayden, Stone & Co.; Earl G. Hines, vice-president of the Equitable Trust Company of New York; Matthew B. Barkley of the General Asbestos and Rubber Company, Charleston, S. C., and Howard Simpson, a brother of President Simpson.

George C. McConnell

George C. McConnell, age 50, factory superintendent of the Fidelity Tire and Rubber Company, Warren, O., died September 18, at his residence in Warren. His death followed a general break-down in health and he had been practically confined to his home for the past several months.

Mr. McConnell had been in the rubber business during the greater part of his life. At various times he was connected with the Mansfield Tire and Rubber Company, the Columbia Tire and Rubber Company, at Mansfield, and the Century Tire and Rubber Company at Chicago. In 1919 Mr. McConnell, with a group of Chicago business men, organized the Fidelity Tire and Rubber Company, securing a factory site at Massillon, O., where he was vice-president and factory manager. In 1926 the factory and general offices of the company were moved to Warren, where he remained until his death.

The funeral services were largely attended, by all of the executives of the company, the general office and factory employees, and friends. Foremen and department heads of the factory acted as pallbearers. Interment was in the family burial plot in Mansfield, O. He is survived by his widow and one nephew, Art McConnell, of Jamestown, N. Y.

Monsanto on N. Y. Exchange

Application was made October 3 to list 310,852 shares of common stock of no par value of the Monsanto Chemical Works on the New York Stock Exchange. The Monsanto Chemical Works, which recently acquired the Rubber Service Laboratories Company, now has its stock listed on the New York Curb Exchange.

Kleinert Earnings High

The I. B. Kleinert Rubber Company has reported for the seven months ended July 31, 1929, a net income of $544,193 after federal taxes. This is equivalent to $2.86 a share earned on 190,000 no-par shares of common stock outstanding.

GOODYEAR RECLAIM MILL OPENS AT GADSDEN, ALA.

The new $1,000,000 rubber reclaiming plant of the Goodyear Tire & Rubber Company began operations at Gadsden, Ala., during the last week of September. More than 150 carloads of used tires were on hand for the initial operations.

When the new mill reaches full production, it will turn out 50,000 pounds of reclaimed rubber daily, all of which will be shipped to Akron, O., for the manufacture of mechanical rubber goods. Three carloads will be processed daily and will be sent in from practically every shipping centre in the South.

ELIHU HARPHAM, for more than ten years associated with the real estate business in Akron, O., has been appointed to the real estate staff of the Goodyear Tire & Rubber Company.

GILLETTE JUMPS OUTPUT AND DECLARES DIVIDEND

That production had been increased 42 per cent during the past year and would be further increased to a capacity of 10,000 tires a day by new plant expansions was announced by R. W. Hutchens, president and general manager of the Gillette Rubber Company, Eau Claire, Wis., at the annual meeting of the stockholders on September 20. For the past four years, Mr. Hutchens explained, the plant has operated three eight-hour shifts at full capacity daily.

Declaration of a quarterly dividend of 35 cents a share was also announced, the dividend to be paid October 1 to stock of record September 20. The company recently increased its authorized capital from $1,290,000 to $3,000,000 to provide for expansions.

In the election of officers, R. B. Gillette was named chairman of the board; R. W. Hutchens, president and general manager; S. C. Moon, vice-president; I. T. Gilruth, vice-president and general counsel; C. B. Reynolds, secretary and treasurer and H. C. Olson, assistant secretary and assistant treasurer. The directors, in addition to Messrs. Gillette, Hutchens, Moon and Gilruth, are William Kootz, John Rossi, H. D. Whitehouse, A. L. Martin and Fred Hawley.

Stedman Declares Dividend

The board of directors of the Stedman Products Company, manufacturer of rubber flooring and other rubber products, South Braintree, Mass., has declared the 44th consecutive quarterly dividend of $1.75 per share on the preferred stock of the company. This was paid on October 1 to stockholders of record at the close of business September 26.

Rubber Stocks Break

Ten stock issues of leading rubber manufacturing companies sank to new lows for 1929 or longer during one of the most severe periods of depression on the country's security markets. Faultless Rubber common on the Cleveland exchange was a bright spot among rubber issues, making a new high on news of increased dividends and rights. Prices of rubber company shares on October 4 compare as follows:

	Last Price		High	Low
	Oct. 4	Sept. 18	—1929—	
Ajax	3	4⅛	11¼	2½
Falls	5	4	11⅜	4
Faultless	44	42	45	30
Firestone	235	227	309	202½
do. 6% pfd.	108¼	109	111	108
Fisk	6⅝	8	20⅛	6½
do. 1st pfd.	33½	42¼	72½	33½
General	250	256	298	236
do. pfd.	93	95	102	93
Goodrich	64⅞	72½	105¾	64¾
do. pfd.	—	—	115¼	111
Goodyear Com.	94¼	109¾	154½	93¼
do. pr. pfd.	98½	101	104⅞	98½
India	35	35	73	35
Intercontinental	8⅝	9¼	14¼	8⅛
Kelly Springfield	7⅛	10	24	7⅛
do. 1st pfd.	46	—	100	46
Lee	8½	—	25	8½
Miller	10⅛	11½	28¾	11½
do. pfd.	40	41	83	41
Mohawk	20	27½	66	19
do. pfd.	78	78	90½	78
Norwalk	1⅞	—	6⅛	1¾
Pirelli	58	62½	68	50½
Seiberling	26	27¼	65	25
do. pfd.	90	90	107⅞	90
U. S. Rubber	50⅛	55⅝	65	42
do. pfd.	72	77	92½	67½

Names in the News

L. H. DUGGAN, formerly of the commercial tire department, Fisk Rubber Company, Chicopee Falls, Mass., has been appointed manager of the government sales department. This department was organized for the purpose of promoting the sale of Fisk products to the various federal government departments, the states, counties and municipalities.

A. H. MASSEY, general sales manager of the Combination Rubber Company, Trenton, N. J., has returned from a trip of three weeks through the south and southwest, where he called upon the trade.

ARTHUR B. NEWHALL, former vice-president and general manager of the Hood Rubber Company, Watertown, Mass., has been named general manager of the B. F. Goodrich Company footwear division. His offices will be in Akron in the future.

F. R. HENDERSON, of the F. R. Henderson Company and Henderson Rubber Reports, Inc., president of the Rubber Exchange of New York, has accepted the presidency of the New York & Republic Corporation, a $5,000,000 investment trust recently incorporated in Delaware. Mr. Henderson is widely known in the rubber world and has attracted considerable attention in Wall Street for his successful organization of commodity exchanges. He organized the Rubber Exchange of New York four years ago and later took a leading part in the organization of the National Raw Silk Exchange, the National Metal Exchange and the New York Hide Exchange.

GUSTAV BOESS, lord mayor of Berlin, Germany, and his official party who have been touring the United States, were invited to Akron to visit the plants of the Goodyear Tire & Rubber Company and the Goodyear-Zeppelin Corporation.

H. B. SLUSSER, vice-president and treasurer of the Pocono Rubber Cloth Company, Trenton, N. J., has returned from a four-week trip to California where he spent his vacation and also called on the trade. He reports business conditions there as very satisfactory and states that the Trenton plant of his company is running to capacity.

J. W. O'MEARA, of Detroit, formerly publicity manager for the B. F. Goodrich Company, and PAUL C. MCPHERSON, former assistant to the advertising manager of the Goodyear Tire & Rubber Company, have become president and vice-president of the newly formed Dealer Advertising Corporation of America, Inc., with offices at New York, Detroit and Chicago. The company was formed to specialize in local advertising including direct mail, window displays, identification signs, imprinted posters and advertising novelties.

EARLE L. BRYANT, who has been manager of the Morgan & Wright plant at Detroit, has been appointed to act as an assistant to the general manager of the tire department of the United States Rubber Company.

CLARENCE D. WILSON, secretary and treasurer of the Luzerne Rubber Company, Trenton, N. J., spent his vacation with his family in Canada.

M. H. TISNE, manager of manufacturers' accessories for A. Schrader's Son, Inc., valve and gauge makers, Brooklyn, N. Y., was re-elected president of the Cycle Trades of America, Inc., at its recent convention

M. H. TISNE

in Atlantic City. He says that more than $250,000 will be spent in advertising bicycles next year, continuing the campaign which the C. T. A. started several months ago. Mr. Tisne, who was graduated from Fordham University in 1905, was one of the original Boosters, an organization that has done much to promote good will in the automotive field.

FRANK K. ESPENHAIN, executive vice-president, and other officials of the Fisk Rubber Company, Chicopee Falls, Mass., left the factory on October 1 for Atlanta to address the first of a series of regional sales conferences which will take place in cities as far west as Salt Lake City and as far south as Dallas. With Mr. Espenhain on the 2,500-mile trip are CHARLES M. PIPER, E. E. DEARTH, C. H. JOHNSON, N. B. BRODHEAD, J. I. O'BRIEN, R. G. BATH, and FRANK L. MCCABE.

FREDERICK RUSH, of the Goodyear Tire & Rubber Company publicity department, traveled to Detroit from Akron last month in the company's airship, the *Defender*. The ship was flown to the Grosse Isle Airport in the Michigan city on September 13 in two hours and ten minutes by Pilot JACK A. BOETTNER and remained at Detroit for ten days. Others who made the trip were HARRY BLYTHE, assistant to President P. W. LITCHFIELD, and R. RODERICK, assistant to Boettner.

ALBERT B. NORWALK, of New York City, has been appointed vice-president in charge of sales for the Murray Rubber Company, Trenton, N. J. He succeeds ALBERT J. DORNSEIF, who resigned to accept a position with the Kelly-Springfield Tire Company, Cumberland, Md.

BRUCE BEDFORD, president of the Luzerne Rubber Company, Trenton, N. J., has returned from a lengthy tour through Europe. He was accompanied by his family.

JOHN A. LAMBERT, vice-president, treasurer and general manager of the Acme Rubber Manufacturing Company, Trenton, N. J., is receiving the sincere commiseration of his business associates on the death of his wife on September 10. The late Mrs. Lambert, a native of Freeport, Ill., lived in Trenton for 27 years and is survived by her husband and seven children.

PHIL J. KELLY, advertising manager of the B. F. Goodrich Company, is one of the speakers scheduled at the National Convention of the Direct Mail Advertising Association, now taking place at Cleveland, O. He will talk on "Direct Mail as Retail Action Advertising.'

H. A. HOFFMAN, well known rubber chemist, has been appointed head of the development department of the Mason Tire & Rubber Company, Kent, O. He is perfecting a white side wall for the Mason De-Luxe line of tires which will not discolor.

HOWARD J. HERRLINGER, special sales representative of the Firestone Tire & Rubber Company for the past five years, has been appointed to the company's Akron office to specialize in the merchandising and advertising of bus, truck and airplane tires.

G. A. RICHARDS, former manufacturers' sales representative of the Firestone Tire & Rubber Company, has been elected vice-president of the Automobile Radio Corporation. He will have direct charge of manufacturers' sales of the Transitone radio for installation in passenger cars.

CATALPO

for

Footwear

Rubber News Around the World

FORD RUBBER PROJECT THRIVING IN BRAZIL

With work going rapidly forward, the Ford rubber plantation project along the Tapajos River in Brazil is beginning to assume definite shape. Boa Vista, the centre of operations of the Ford Companhia Industrial, is becoming a thriving community, and actual planting has already begun on a section of the 5,000,00 acre grant. This was revealed by William C. Cowling, a representative of the Ford Motor Company, Detroit, Mich., before he left Belem on September 17 to return to the United States.

In the short space of a year more than 700 hectares of wild land have been cleaned and burned for the rubber plantation and more than 400 hectares have been actually planted with rubber seedlings. About 1,500 men are employed at the company's property, 90 per cent of whom are Brazilian. Laborers are adapting themselves easily to American ways of doing things.

Boa Vista has all the modern comforts. It possesses a sewer system and a water and light supply. Six big houses have already been built for the accommodation of the officials and an up-to-date hospital has been built. Medical assistance is rendered both by Brazilian and American doctors. The percentage of sickness is very low. A second camp has also been completed about five miles from the original camp at Boa Vista.

Roads are being built all over the property with the use of modern machinery, and plans are under way for the construction of new houses and other buildings.

"The business principles of Mr. Ford," said Mr. Cowling, "are always based on the policy of getting along with the ways of people of the country where his activities are exercised. Mr. Ford considers Brazil not simply as a market for selling products, but he aims, from an industrial point of view, to do everything possible for Para and the rest of Brazil, not only for his personal profit but also for the profit of the country.

"Mr. Ford's methods in developing a country are not based on a policy of continually taking out and putting little in. He has faith that Brazilians and especially inhabitants of Pará shall be patient and will grant him sufficient time to complete his plans. He feels sure that when all this becomes a reality, Brazil will feel as proud of the Ford Tapajos project as he himself will be."

German-American Rubber Firm

The Metal Company, together with the Dewey Company and the Almy Chemical Company, Cambridge, Mass., has established the Darex Company in Frankfurt, Germany, for the manufacture and sale of rubber goods. The new firm has been capitalized at £25,000.

AFRICAN LIONS PLAY WITH GENERAL TIRES

The Colorado-African Expedition, headed by Paul L. Hoefler of Denver, has returned to the United States after having accomplished the first crossing ever made of Central Africa. It took nearly a year for the expedition to cross equatorial Africa from Mombassa on the east coast to Lagos, Nigeria, on the west coast, traveling in two automobile trucks, with several hundred native carriers and guides.

While in camp near Lagos, one of the spare General truck tires which was lying on the side of an ant-hill aroused the curiosity of three lions who first stalked the casing and then, finding that it did not move, toyed with it for several minutes, during which time Hoefler was able to snap their pictures. The expedition, all of whose tires were furnished by the General Tire & Rubber Company, finished the trip of 13,282 miles with the same casings with which they started.

Dominion Rubber Builds

The Dominion Rubber Company, Ltd., Montreal, Que., is having plans prepared for the construction of a factory at St. Jerome, Que. The estimated cost of the new plant is $400,000.

GOODYEAR FOREIGN MEN GATHER AT CONFERENCE

The ninth annual inter-plant conference of the Goodyear Tire & Rubber Company was held at Akron during the week from September 23 to 28. C. S. Slusser, vice-president, opened the sessions with an address of welcome in which he stated that the present year, which has witnessed tremendous Goodyear expansion everywhere, has been the most successful in the company's history. Responses were made by E. H. Koken, general superintendent, Canada; C. W. Young, superintendent, Killingly; E. J. Thomas, general superintendent, California; A. O. Zimmerman, Australia; L. S. Hall, superintendent, New Bedford; A. M. Hardy, assistant superintendent, Bowmanville; E. J. Christy and W. F. Hazen, Wheeling Coal Mines; Mike Flannery, general superintendent, England; Frank Steele, general superintendent, Gadsden; J. P. Goudreault, superintendent, St. Hyacinthe; G. I. Parmenter, superintendent, Cartersville; P. W. Beggs, superintendent, California textile; R. H. Stewart, superintendent, Cedartown; J. P. Heaney, superintendent, Rockmart; Wm. Stephens, general superintendent, Akron, and Fred Harpham, vice-president.

GOODYEAR OF CANADA HAD RECORD PROFITS

Although definite figures have not as yet been announced, C. H. Carlisle, president and general manager of the Goodyear Tire & Rubber Company of Canada, has stated that production, sales and earnings of his company for the fiscal year ended September 30 were the highest in its history.

Production slowed down slightly during the last quarter, due to abnormally high inventories of finished tires. The plant, recently closed for repairs and installation of new machinery, is ready for production and has resumed night and day operation.

The company expects to redeem 2,300 shares of $100 par preferred stock out of current earnings, making a total of 5,260 shares so redeemed since April, 1927. The common stock, on approval of a new by-law by stockholders, will be reduced by 4,670 shares now held in trust, leaving 128,630 shares outstanding.

LEYLAND & BIRMINGHAM TRADING PROFIT GAINS

The report of the Leyland & Birmingham Rubber Company, Ltd., for the year ended June 30, 1929, shows a trading profit which exceeds those of the preceding two years combined. The actual profit before depreciation was £140,348 (approximately $675,000) as compared with £81,204 in the preceding year and £40,132 in the 1926-27 year.

The ordinary shareholders get an extra 5 per cent in consideration of the high earnings, and the directors, who have already paid 2½ per cent, propose to pay a final dividend of 7½ per cent and to give a bonus of 2½ per cent. The board also proposes to write off the balance of the new issue expenses, amounting to £8,601, and to add £15,000 to the reserve, which has had no appropriations since the £5,000 for 1923-24 and £10,000 for 1924-25. The general reserve will now be £95,000. They also add nearly £8,000 to the balance carried forward, making it £33,696, which exceeds any of the amounts in the last six years.

CATALPO
for
Frictions

Rubber Goods and Specialties

India Owl Tire

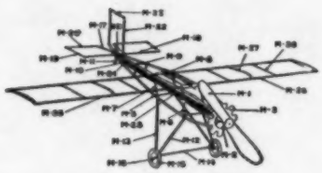
As a lower-priced companion line to its regular and super service tires, the India Tire & Rubber Company, Akron, O., has entered into production on a new series of casings and tubes under the name "Owl." The new tires will carry the name of the company and the regular standard life-time

warranty, although the prices have been figured exceptionally low in order to place India dealers in a competitive position for the class of trade interested in buying this type of tire. The casing is rugged in appearance and embodies the centre traction design. Owl tubes are being made for the 14 sizes of casings in a red color and low in price.

Two New Dill Products

Two new products being announced by the Dill Manufacturing Company, Cleveland, O., are shown below. The Super Pressure Tester, on the left, is constructed so that all working parts are on the inside of

the barrel, thus permitting a firm hold, regardless of the position in which it is held without in any way interfering with its register. The parts of the new Dill Instant-On Valve, shown on the right, are said to represent a solution to the truck tire valve problem, enabling truck tubes to be shipped with bases only so that dealers may insert the desired valve therein.



Mocar Model Airplane

The Mount Carmel Manufacturing Company, New Haven, Conn., is introducing under the name of the Big Mocar an aluminum construction model airplane with elastic band motive power and rubber-tired wheels. The model, when assembled, has a 30-inch wing spread, an 18-inch fuselage and an 11¼-inch aluminum ball bearing propellor. The outfit is sold in an attractive display box, with the parts mounted on a board and marked for easy assembly, together with covering material, cement and colors.

Two-Way Shock Absorber

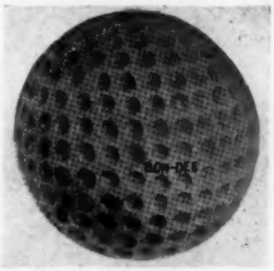
A new two-way hydraulic shock absorber for automobiles, recently announced by the Monroe Auto Equipment Company, Monroe, Mich., provides an exceptional degree of riding comfort since the spring rebound and the compression are both cushioned by means of a separate piston and valve opening in a single chamber, this type of engineering reducing the sudden jolting in recoil. Connecting joints are ball and socket type, rubber insulated, noiseless and are entirely free from necessity of lubrication. F. J. Thibault, chief engineer, and J. M. Nickelsen, of the University of Michigan department of engineering, are credited with perfecting the details of the new accessory.

Soft Rubber Napkin Rings

Napkin rings of soft rubber have recently achieved considerable popularity in Germany and may be introduced into the United States in the near future. The "rings" are actually strips 10 to 12 centimetres in length, 2½ centimetres in width, and about 2 millimetres thick, and assume the ring shape when fastened about the napkin by means of a buttonhole at one end and a small ball-shaped hard rubber button at the other. Strong textile reinforcement at the ends prevents the tearing of the buttonhole, and the rings are being made both plain and patterned and in a variety of art shades.

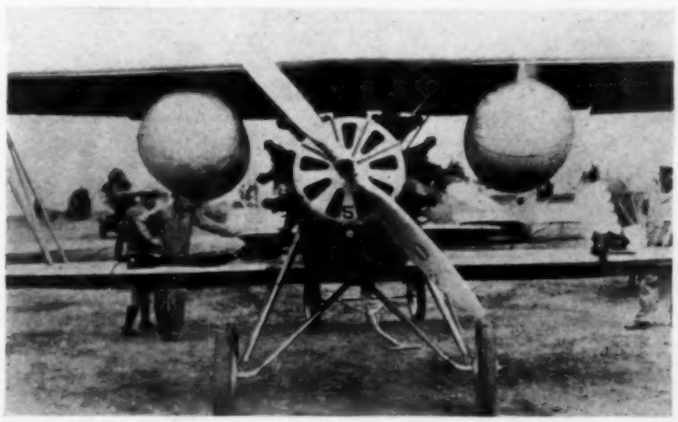
Bon Dee Golf Ball

Made in the newly approved larger and lighter size, this ball is the latest in the line of the Bon Dee Golf Ball Company, Detroit, Mich. It has a diameter of 1.68 inches and a weight of 1.55 ounces, as of-



ficially adopted by the United States Golf Association for tournament play. According to the manufacturer, the new Bon Dee ball carries for a longer distance on the drives than the old size and can also be controlled better with the iron shots. Both mesh and dimple designs are furnished on the tough balata covers.

Rubber Bags Keep Plane Above Water



ONE of the interesting exhibits which the Navy Department presented at the annual congress of the National Safety Council at Chicago from September 30 to October 2 was this airplane, equipped with a set of rubberized fabric bags perfected to keep the plane from sinking in the event of a crash or a forced landing on water. The bags after the landing are inflated with carbon dioxide.

Current Crude Rubber Items

RUBBER FUTURES NEAR LOW FOR CURRENT YEAR

Quotations for futures on the Rubber Exchange of New York sank to the lowest levels reached since January 10 during the closing days of the past fortnight. By October 2 the spot price for crude rubber had dropped to 19.10 cents a pound, as compared with 19.90 cents at the end of the previous fortnight.

A wave of bearish selling followed the reported increase in Malayan exports, and there appeared to be little support for the market in any quarter. The heavy declines on the various security exchanges had their effect on the commodity by adding to the speculative selling. At no time, however, was the turnover on the Rubber Exchange very heavy, the amount of daily sales going above the 600 mark only twice in the period.

At the close, traders were awaiting news from F. A. Seiberling on his arrival from Europe, where he was reported as having opened negotiations with British and Dutch planters looking toward price stabilization. It was expected that a statement by him of any such plans would result in a bullish demonstration.

The table below shows the daily price range on the exchange and indicates the number of daily sales:

S. J. Pike, Jr., Promoted

Sidney J. Pike, Jr., has been elected vice-president of T. A. Demond & Company, Inc., importers of crude rubber at 29 Broadway, New York City. He has already entered into the duties of his new position.

DEALERS' RUBBER STOCKS DECREASE IN THE EAST

Stocks of crude rubber in dealers' hands at leading Malayan ports are declining, it was revealed in a cable to the Rubber Exchange of New York recently. The total on hand as of August 31, was 33,576 tons, as compared with 36,651 tons at the end of July.

Of this amount, 25,234 tons were held in Singapore, as against 28,505 tons at the close of the previous month. The report follows:

Tonnage at	*August*	*July*	*Aug.* 1928
Singapore	25,234	28,505	16,286
Penang	5,600	5,354	2,685
Malacca	2,492	2,576	—
Wellesley	176	155	—
Dindings	74	61	—
Total	33,576	36,651	18,971

SIR ARTHUR DU CROS, managing director of the Dunlop Rubber Company, Ltd., has contributed £500 toward the development of sun bathing facilities that are expected to make London a health resort. This movement has been organized as a result of similar activities among the youth of Germany, Czechoslovakia and Russia.

RUBBER EXCHANGE WILL ELECT 1930 OFFICERS

The annual meeting of the Rubber Exchange of New York was held in the exchange room, 31 South William street, on October 8. The Board of Governors of the exchange presented a general statement of affairs as well as a report on the financial condition, and also fixed the annual dues for the coming year.

Annual election of officers and Board of Governors, as well as inspectors of election, will be held in the exchange room on October 15. Polls will be open between 11 A. M. and 3 P. M. that day.

The following floor committee has been appointed: Frank D. Pressinger, chairman; James N. Shannon, Lawrence G. Odell, Alfred Croft and William R. Velthaus. Following have been named on Quotation Committee: Frank D. Pressinger, chairman; Alfred Croft and William R. Velthaus.

URGES RUBBER LEADERS TO FORM SELLING PLAN

W. Arthur Addinsell, chairman of Abaco (Selangor) Rubber, Ltd., spoke regarding the outlook at the annual meeting of his company, which was held in London recently. Mr. Addinsell said that so long as the present conditions of production and marketing exist there are bound to be fluctuations in the price of the raw material, with its consequent effect on share values.

"I marvel at the inertia of our rubber-growing leaders," he continued, "in not bringing about some system of organized selling and putting an end to the pernicious custom of forward sales which has such a devastating influence on the whole industry. Still, bona fide investors need not be nervous—indeed, I do not think it unreasonable to look forward to the future with confidence."

GEORGE FLACH, member of the Rubber Exchange of New York, has become associated with the firm of H. P. Schwarzman & Co., crude rubber brokers.

Closing Prices on Rubber Exchange of New York, Inc.

FROM SEPTEMBER 19 TO OCTOBER 3, 1929

		Spot	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sales*
Sept.	19	19.90	20.30	20.70	21.10	21.30	21.50	21.70	22.00	22.20	22.40	22.50	22.70	—	212
	20	19.90	20.30	20.70	21.10	21.20	21.50	21.70	21.90	22.10	22.30	22.40	22.60	—	195
	21	19.90	20.20	20.60	21.00	21.10	21.40	21.60	21.80	22.00	22.20	22.30	22.50	—	97
	23	19.60	20.00	20.50	20.90	21.10	21.40	21.60	21.80	21.90	22.10	22.30	22.50	—	193
	24	19.60	19.90	20.40	20.90	21.00	21.20	21.50	21.70	21.90	22.10	22.30	22.40	—	350
	25	19.80	19.80	20.00	20.60	20.80	21.00	21.20	21.40	21.60	21.80	22.00	22.20	—	441
	26	19.60	19.60	20.10	20.50	20.70	21.00	21.20	21.40	21.60	21.90	22.10	22.30	—	420
	27	19.40	19.40	19.50	20.20	20.40	20.70	20.90	21.20	21.40	21.60	21.80	22.00	—	662
	28	19.40	19.40	19.60	20.10	20.30	20.60	20.80	21.00	21.30	21.50	21.70	21.90	—	210
	30	19.50	19.50	19.90	20.20	20.50	20.80	21.00	21.20	21.40	21.70	22.00	22.20	—	141
Oct.	1	19.50	19.50	19.80	20.20	20.40	20.70	21.00	21.20	21.40	21.60	21.80	22.00	22.20	263
	2	19.10	19.10	19.40	19.70	20.00	20.30	20.60	20.80	21.00	21.20	21.30	21.50	21.70	683
	3	19.20	19.20	19.50	19.70	19.90	20.20	20.50	20.70	20.90	21.10	21.40	21.60	21.80	475

*In lots of 2½ tons

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Harry C. Miller

Harry C. Miller, general manager of manufacturers' sales for the B. F. Goodrich Company, died at Harper Hospital, Detroit, Mich., on the evening of September 23 after four days' illness of acute heart disease and congestion of the lungs. Mr. Miller, who was 54 years old, was stricken while on a business trip to auto manufacturing companies at Detroit. Dr. D. B. Lowe, Goodrich physician, remained with Mr. Miller until his death, together with Mrs. Miller and Charles J. Miller, a brother.

Mr. Miller had lived in Akron practically all his life and had been in the employ of Goodrich for 34 years. He was born at

H. C. MILLER

Mansfied and came to Akron when a boy. Immediately following his schooling, Mr. Miller went to work at Goodrich and had been in the employ of that company ever since.

Mr. Miller started with the Goodrich company in 1895 and worked in various sales departments until 1900 when he was sent to Detroit as representative of manufacturers' sales. Eight years later he was named branch manager in New York.

In 1910 Mr. Miller and C. E. Cook were sent to organize the Goodrich branch system on the Pacific coast. Until that time the company had only one distributor in the west. He was recalled to Akron in 1915 and made assistant general sales manager.

Mr. Miller was named sales manager of manufacturers' sales in 1924 and served in that capacity until his death.

Harold B. Smith

Harold B. Smith, assistant to the general factory manager, tire department, of the United States Rubber Company, was burned to death in the Detroit restaurant fire on September 20 in which 19 lives were lost. He had been with the company for 20 years, serving at Hartford, New York and most recently at Detroit. Burial was at Hartford.

Morris A. Pearson

Morris A. Pearson, assistant treasurer of the National Rubber Machinery Company and sales engineer of the De Mattia Brothers Division of that organization at Clifton, N. J., died after a lengthy illness at the Griffin Hospital, Seymour, Conn., on September 21. He had been undergoing treatment at the hospital since early in the spring.

Born at Seymour, Conn., September 29, 1882, Mr. Pearson started his career in the offices of the Farrel Foundry & Machine Company, Ansonia, Conn., where he stayed for 14 years. He resigned in 1912 to join a manufacturer at Akron, O., in order to gain a more practical knowledge of the trade and followed up that experience by working for a time with the Turner, Vaughn & Taylor Company and with the Allen Machine Company, Erie, Pa., manufacturers of rubber factory equipment, as chief engineer. He was the eastern and export representative of the Allen firm with headquarters in New York City until 1921, after which he became sales manager. On December 1, 1922, Mr. Pearson became associated with De Matia Brothers and remained with that organization after it was merged into the National Rubber Machinery Company last year.

Mr. Pearson introduced the manufacture of rubber goods machinery in the middle west and was the inventor of the removable nut holder which is almost universally specified on mill construction by user of rubber machinery. He was a contributor of various articles of interest to publications having to do with the industry, and he was a member of the American Society of Mechanical Engineers. He designed the complete mill and calender equipment for many tire and other factories.

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Complete details and information from Technical Service Department

BINNEY & SMITH CO.
41 EAST 42nd ST., NEW YORK, N. Y.

GOODYEAR CONTRACTS FOR TANKS FOR HELIUM

The Goodyear-Zeppelin Corporation has awarded the contract for the storing of helium gas for dirigibles to the A. C. Smith Corporation, Milwaukee, Wis. For the Akron Zeppelin docks, it was desired to maintain a storage capacity of at least 1,000,000 cubic feet of dischargable gas, which is approximately the volume of one cell for the new 6,500,000 cubic feet ships being built for the United States Navy.

New construction methods by the Smith corporation in making the storage of the gas under pressure permit a considerable reduction in cost. This is effected by a battery of tanks 80 feet long and two feet in diameter. Two lengths of the Smith-welded gas line pipe are joined and heads are welded to the ends to make up each tank. Ninety-six tanks of the Smith design, to be buried underground, will be supplied to take care of the necessary storage.

Government Specifications

The Federal Specifications Board is submitting to representative manufacturers suggested specifications for garden hose, water hose, wash-deck hose and water suction hose couplings. The board will send copies of the proposals to any firms interested and will be glad to receive any comments or suggestions as to changes which may be thought desirable. These comments should be sent to reach the board by October 23 to receive attention from the technical committee considering the subject.

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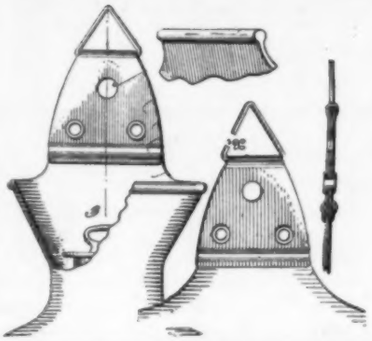

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LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, OCTOBER 3, 1929

COTTON

DURING the month of September the average spot closing price for middling upland cotton was 18.83 cents a pound, as compared with 18.62 cents during August and with 18.67 cents during September, 1928. In the course of the past fortnight, the price quotations rose slightly, opening on September 19 at 18.65 cents and closing on October 3 at 18.90 cents a pound.

Recently the eastern belt has been visited by a most damaging storm, stimulating a demand for cotton that was sufficient to advance prices about 50 points from the lows reached in late September.

While further recessions in price may occur, it is the general opinion that cotton prices are due for a gradual rise. Some brokers believe present price levels particularly attractive because they foresee an actual world shortage of American cotton.

High, low and closing prices quoted on October 7 were as follows:

	High	Low Oct. 7	Close	Close Sept. 18
Oct.	18.84	18.82	18.84	18.42
Nov.	——	——	18.85	18.59
Dec.	18.90	18.84	18.89	18.78

Tire Fabrics

The tire fabric market has continued unchanged and quiet, with little inquiry or sales on which to base quotations. American 1 1/16-inch carded peeler cords 23s 5/3 ply continued on the basis of 45 to 45½ cents net f.o.b. mill. Akron was reported as little interested in further commitments at the moment. Late prices were as follows:

CORD			
Peeler, carded, 23/5/3	lb.	.47 @	.47½
Peeler, carded, 23/4/3	lb.	.48½@	.49
Peeler, carded, 13/3/3	lb.	.44½@	.45
Peeler, carded, 15/3/3	lb.	.43 @	.44
Egyptian, carded, 23/5/3	lb.	.51 @	.52
Egyptian, combed, 23/5/3	lb.	.57 @	.58
CHAFERS			
Carded, American, 8 oz.	lb	.40 @	.41
Carded, American, 10 oz.	lb	.40½@	.41½
Carded, American, 12 oz.	lb	.40½@	.42½
Carded, American, 14 oz.	lb	.39 @	.45
LENO BREAKER			
Carded, American, 8¼ oz.	lb.	.40 @	.46
Carded, American, 10¼ oz.	lb.	.40 @	.46
SQUARE WOVEN			
Carded, American, 17¼ oz. 23-11 ply	lb.	.47 @	.48
Carded, American, 17¼ oz. 10-ply	lb	.39 @	.40

Sheetings

Sheetings have been slightly more active and fractionally higher during the fortnight. The 40-inch 3.75-yard were advanced in most quarters to 9⅛ cents for contracts and 40-inch 4.25-yard to 8⅛ cents. Quotations reported by the Textile Brokers Association follow:

40-inch, 2.50-yard	yd.	— @	.12⅝
40-inch, 2.85-yard	yd.	— @	.11¼
40-inch, 3.15-yard	yd.	— @	.11
40-inch, 3.60-yard	yd.	— @	.09½
40-inch, 3.75-yard	yd.	— @	.09¼
40-inch, 4.25-yard	yr.	— @	.08¼

Ducks

Cotton ducks have continued unchanged with moderate demand for enameling ducks in some quarters. Prices, remaining practically the same as those of a fortnight ago, closed as follows:

Belting and Hose	lb.	.35 @	.36½
Enameling	lb.	.32½@	.36
Single filling	lb.	.14½@	.16
Double filling	lb.	— @	.18

RECLAIMED RUBBER

Rather than to speculate about the lessening demand during the few remaining months of the current year, rubber reclaimers are beginning to look forward with interest and high expectation to 1930. It is generally felt that next year will be even greater than 1928 for the rubber industry and that the consumption of reclaim will consequently rise to new record heights. Many authorities have pointed out the likelihood that rubber production may not be able to keep pace with increasing consumption, and reclaimers are studying this possibility with keen interest with relation to its effect upon the use of their own product. Prices for the various grades changed little during the fortnight and closed as follows:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.12¼ @	.12½
Super-Reclaim No. 2 Black	lb.	.11 @	.11½
High Tensile Red	lb.	.12 @	.12¼
Shoe			
Unwashed	lb.	.07 @	.07¼
Washed	lb.	.09¾@	.10
Tube			
No. 1 (Floating)	lb.	.13 @	.13½
No. 2 (compounded)	lb.	.09¾@	.10
Tires			
Black	lb.	.07¼@	.07½
Black, selected tires	lb.	.07½@	.07¾
Dark Gray	lb.	.09½@	.10
Light Gray	lb.	.11½@	.12
White	lb.	.12 @	.12½
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07¼@	.07½
Miscellaneous			
Mechanical Blends	lb	.06½@	.07
Red	lb.	.12 @	.12¼

Scrap Rubber

Demand for scrap rubber is expected to increase shortly as reclaimers begin to prepare for record production schedules in 1930. Prices remained unchanged as follows:

(Prices to Consumer)			
Auto tire peelings	ton	42.50	@45.00
Standard White auto	ton	45.00	@47.50
Mixed auto	ton	24.50	@25.00
Bicycle tires	ton	18.50	@20.00
Clean solid truck tires	ton	24.00	@25.00
Boots and shoes	cwt.	1.45	@ 1.50
Arctics, untrimmed	lb.	.00⅞@	.01
Inner tubes, No. 1	lb.	.08 @	.08¼
Inner tubes, No. 2, compounded	lb.	.04½@	.04¾
Inner Tubes, Red	lb.	.05 @	.05⅛
Air Brake Hose	ton	27.50	@30.00
Rubber Hose	ton	17.50	@20.00

CRUDE RUBBER

THE average price quotation for spot smoked ribbed sheets during September was 20.375 cents a pound, as compared with 21.30 cents a pound in August and with 19.46 cents in September, 1928. This is the lowest monthly average since January of this year and, although early October quotations have not sunk to the level of early January, it appears that the average for the current month will be even lower. The closing spot price on October 3 was 19½ cents a pound.

At the close general selling and liquidation was influenced by one of the weakest London markets seen in the trade for many weeks, nearby London breaking below 9½d, and by heavy Malayan shipments for September which surpassed the maximum estimates. The Malayan gross shipments for September amounted to 53,484 tons, which is about 3,000 tons more than the shipments of August and some 24,000 tons greater than the shipments in September last year.

A moderate business in actual rubber was noticed in the closing days. New England factories were in the market and picked up moderate weights of ribs and ambers. There was also a fair business in the local dealers trade, but manufacturers continue to pursue a hand to mouth policy in their buying, although there is a fair interest in the futures on breaks.

The gains in London stocks and the recent jump in the amount of rubber invoiced to the United States have also had their effect upon the price situation. By the end of the current year, American stocks on hand will probably exceed the 100,000-ton mark once again.

Prices quoted on the New York outside market on October 3 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Oct.		.19⅝@	.19½
Nov.-Dec.		.19½@	.19⅝
Jan.-Mar.		.20¼@	.20½
First Latex, crepe spot		.20⅜@	.20⅝
Amber Crepe, No. 2		.16¾@	.17
Amber Crepe, No. 3		.16½@	.16¾
Amber Crepe, No. 4		.16¼@	.16½
Brown Crepe, Clean thin		.16½@	.16¾
Brown Crepe, specky		.15⅞@	.16¼
Liquid Latex, per gal.		.90	
Paras—			
Up-river Fine		.19½@	.19¾
Up-river Medium		Nominal	
Up-river Coarse		.11 @	
Acre Bolivian, fine		.19¾@	.20
Coucho Ball, Upper		.11 @	
Islands, fine		Nominal	
Centrals—			
Central, scrap		.11 @	.11½
Esmeraldas		.11 @	.11½
Balata—			
Block, Colombia		Nominal	
Block, Ciudad		.51 @	.52

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers		
Spot-Oct.	@	9½d
Nov.-Dec.	9⅝d@	9⅞d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers		
Spot	@	9⅝d

H. MUEHLSTEIN & CO., Inc.

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LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

NEW YORK, October 3—Chemical suppliers to the rubber industry still report a steady, if not quite so heavy, demand for their products. The rubber footwear industry is now approaching its peak, and other lines as well are maintaining high production schedules and compensating in some measure for the slackening of activity at the tire factories. Export business is also holding up well.

It appears that there will be no general price movement of consequence in rubber chemicals and compounding ingredients for the remainder of the current year. And, due to the fact that even heavier rubber factory production in 1930 will probably be balanced by an increased chemical output, there seems no reason to look for undue fluctuations in price next year.

ACCELERATORS

Organic				
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-20	lb.	.64	@	.68
Accelerator 102	lb.			
Accelerator 552	lb.			
Accelerator 808	lb.			
Accelerator 883	lb.			
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16¼
Crylene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.52
Diphenylguanidine	lb.	.30	@	.36
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.34	@	.44
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.58½	@	.61
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.	.37½	@	.40
Monex	lb.	3.25	@	—
Oxynone	lb.	.68	@	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92	@	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45	@	4.60
R & H 40	lb.	.40	@	.42½
R & H 50	lb.	.40	@	.42½
R & H 397	lb.	.75	@	.77½
Safex	lb.	1.20	@	1.25
Tensilac, No. 39	lb.	.40	@	.42½
Tensilac, No. 41	lb.	.50	@	.52½
Thermic F	lb.	.50	@	.55
Tolocarbanilide, drums	lb.	.25½	@	.28½
Thionex	lb.			
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.62½
Ureka	lb.	.75	@	1.00
Vulcanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Waxene	lb.	.30	@	.32
Z 88	lb.	.50	@	.60
Inorganic				
Lead, sublimed blue	lb.	.08¼	@	—
Lead, white	lb.	.10½	@	.12½
Litharge, domestic	lb.	.09	@	—
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)				
Blues				
Prussian	lb.	.35	@	.40
Ultramarine	lb.	.06	@	.30
Browns				
Sienna, Italian	lb.	.05½	@	.12½
Umber, Turkey	lb.	.04½	@	.07
Greens				
Chrome, light	lb.	.27	@	.31
medium	lb.	.28	@	.31
dark	lb.	.31	@	.34
Chromium Oxide, bbl.	lb.	.31	@	.38
Reds				
Antimony crimson, 15/17	lb.	.44	@	.50
sulfur free	lb.	.52	@	.60
golden 15/17 F.S.	lb.	.20	@	.25
Indian English	lb.	.08	@	.12
Domestic (Maroon)	lb.	.08	@	.12
Oximony	lb.	.13¼	@	—
Red oxide, pure	lb.	.10	@	.12
Venetian red	lb.	.03	@	.06
Vermillion, quicksilver, English	lb.	1.95	@	—
Whites				
Lithopone, Akrolith	lb.	.05 3/8	@	.06
Lithopone, Albalith	lb.	.05¼	@	.05⅝
Lithopone, Azolith	lb.	.05¼	@	.05⅝
Lithopone, Vanolith	lb.	.05⅜	@	—
Titanox, f.o.b. St. Louis	lb.	.08½	@	.09
Titanium Calcium Pigment, f.o.b. St. Louis	lb.	.08	@	.08½
Zinc Oxide—American Process				
American Azo:				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅝	@	.06⅞
Horsehead Brand:				
Special	lb.	.07	@	.07½
XX Green	lb.	.07	@	.07½
XX Red, lead free	lb.	.06½	@	.07
Kadox, black label	lb.	.10⅜	@	.10⅞
blue label	lb.	.09⅜	@	.09½
red label	lb.	.08	@	.08½
Zinc Oxide—French Process				
White seal	lb.	.11⅜	@	.11⅞
Green seal	lb.	.10⅜	@	.10⅞
Red seal	lb.	.09⅜	@	.09⅞
Yellows				
Chrome	lb.	.16½	@	.17
Ocher, French medium	lb.	.02	@	.03
domestic	lb.	.01⅝	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate	lb.	.10½	@	.12
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—
Blacks				
Arrow "Aerfloted"	lb.	.07	@	.12
Bone Black	lb.	.07	@	.08½
Carbon, compressed	lb.	.06½	@	.12
Carbon, uncompressed	lb.	.06½	@	.11
Disperso	lb.	.11	@	
Drop Black	lb.	.06	@	.10
Fumonex	lb.	.06	@	.09
Gastex	lb.	.04½	@	.08
Lamp Black	lb.	.12	@	.40
Micronex	lb.	.07	@	.12
Velvetex carbon	lb.	.04½	@	.06
Blanc fixe dry f.o.b. works	lb.	.03½	@	.03⅝
Carrara filler	lb.	.01⅝	@	.02
Catalpo (fact.)	lb.	.02	@	—
Clay, China, domestic	ton	8.00	@	9.00
Aerfloted Suprex	ton	10.50	@	22.00
Congaree, c. l. f.o.b. mine	ton	9.00	@	—
Lexington	ton	10.00	@	22.00
Mineral Flour, c. l. fob mine	ton	20.00	@	23.00
Tensulite		15.00	@	—
Glues, extra white	lb.	.22	@	.26
medium white	lb.	.20	@	.24
Magnesia, carbonate	lb.	.07	@	.09
Mica (muscovite) 160 mesh White, water grnd., c.l.	lb.	.06	@	—
White, water grnd., ton lots, whse.	lb.	.07	@	—
White, water grnd., less ton lots, whse.	lb.	.08	@	—
Off color (biotite)	lb.	.05	@	.07
Rotten Stone (powdered)	lb.	.02½	@	.04½
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.30	@	3.70
Talc, domestic	ton	12.00	@	15.00
Whiting, commercial	cwt.	.85	@	1.00
English cliffstone	cwt.	1.75	@	2.00
Superfine	ton	10.00	@	12.00
Witco	ton	12.00	@	—
Wood pulp XXX	ton	45.00	@	—
Wood pulp X	ton	25.00	@	—
Zinc Carbonate	lb.	.09½	@	.10½
Zinc Stearate	lb.	.23½	@	.25
Zinc Sulfide	lb.	.19	@	.19½

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Montezuma, solid	ton	28.00	@	36.00
Montezuma, granulated	ton	32.00	@	42.00
Paradura	ton	62.50	@	65.00
Pioneer, MR, solid	ton	42.00	@	45.00
Pioneer-granulated	ton	52.00	@	55.00
R & H Hydro-Carbon	ton	27.05	@	29.00
Robertson, MR, solid	ton	34.00	@	80.00
M.R. (gran)	ton	38.00	@	80.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 60 degrees	ton	10.50	@	11.50
66 degrees	ton	15.00	@	16.00
Tartaric, crystals	lb.	.37	@	.38
Acids, Fatty				
Stearex	lb.	.15	@	.19
Stearic, double pressed	lb.	.17	@	.22
Alkalies				
Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.40	@	
Oils				
Corn, refined, bbls.	lb.	.11	@	.11½
Cottonseed, crude		.08½	@	.08¾
Cycline	gal.	.27	@	.34
Degras (c.l. 100 bbls.)	lb.	.03¾	@	—
Less c. l. (10-25 bbls.)	lb.	.04	@	—
Lots less than 10 bbls.	lb.	.04¼	@	.04½
Fluxrite	lb.	.05	@	.06
Linseed, Raw C.L. bbl.	lb.	.09½	@	.10
Palm Lagos	lb.	.07¼	@	.07½
Niger	lb.	.07¾	@	.08
Vansulol	lb.	.10½	@	—
Para-Flux	gal.	.17	@	—
Petrolatum, white	lb.	.08	@	.08½
dark amber	lb.	.03¾	@	.03⅞
Pigmentaroil	gal.	.21	@	.26
Pine, steam distilled	gal.	.65	@	.70
destructively distilled	gal.	.55	@	.58
Witco Palm Oil	lb.	.11	@	—
Witco Softener (f.o.b. works)	lb	.02	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.06½	@	.07½
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	9.00	@	10.00
Rosin, grade K, 280 lb. bbl.		8.55	@	—
Pigmentar	lb.	.038	@	.0446
Solvenol, drums	gal.	.48	@	.50
Tarol, drums	gal.	.30	@	.35
Tar Retort, 50 gal.	bbl.	12.50	@	13.00
Solvents				
Acetone, pure	lb.	.13	@	
Alcohol denatured, No. 1 bbls.	gal.	.37½	@	.44½
Benzol, 90%	gal.	.28	@	—
Carbon bisulphide	lb.	.05½	@	.06¼
Carbon tetrachloride	lb.	.06¼	@	.07
Motor gasoline, steel bbls.	gal.	.17	@	—
Naptha, solvent	gal.	.35	@	.40
Turpentine, spirits	gal.	.60	@	.64
wood	gal.	.58	@	.64
destructively distilled	gal.	.40	@	.43
Waxes				
Beeswax	lb.	.56	@	.58
Carnauba	lb.	.33	@	—
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.07	@	.07½
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30
Paraffin (c. l.—f.o.b. N. Y.)				
Yellow crude scale	lb.	.03¾	@	
White crude scale 124/126	lb	.04	@	
Refined, 125/127	lb.	.05¾	@	
Refined, 128/130	lb.	.05¼	@	
Refined, 135/137	lb.	.07¾	@	
Refined, 138/140	lb.	.08¼	@	
Miscellaneous				
RSL Mold Solution	gal.	.75	@	.100

ANTI-OXIDANTS

Albasan	lb.	.70	@	.75
Antox	lb.			
Neozone	lb.			
Oxynone	lb.	.68	@	.80
Resistox	lb.	.54	@	.57
Stabilite	lb.	.64	@	—
VGB	lb.	.55	@	.66

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03¼	@	.03½
Sulfur flour, Refined, 100% pure (bags)	cwt.	2.40	@	2.75
Commercial (bags)	cwt.	1.75	@	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

LATE cables from Malaya report that gross exports of rubber from British Malaya during September totaled 53,484 long tons, as compared with 50,441 long tons during August and with 29,769 long tons in September, 1928. Of this amount, approximately 30,000 tons were destined for United States ports, as against 24,500 tons during August and 21,000 tons in September of last year.

Shipments to the United Kingdom were still large, although lower than the August figures, and tend to explain the continued rise in rubber stocks at London and Liverpool. September shipments to the United Kingdom are estimated at 13,850 tons, as compared with only 2,883 tons during the same month in 1928.

Stocks of crude rubber at London as of September 28 had reached the total of 42,077 tons, as against 35,605 tons at the end of August and 31,440 at the end of September, 1928. In addition, Liverpool stocks are now reported as 10,161 tons as compared with only 2,233 tons at the close of September of last year, so that total English stocks are now higher than at any time since April, 1928.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,819	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,837	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	23,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,715,488	39.76	398,483
1928	439,731	244,854,978	25.03	32,159	18,128,361	25.17	407,572
1927:							
Jan.	43,340	36,753,719	37.36	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984 377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33 301	25,314,412	33 94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	28,592	27,395,428	31.69	2,469	2,014,196	36.43	26,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,784,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,235	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355.511	21.25	2,386	1,349.690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubbe

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,938	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	19,761	31,136	30,137	33,702	41,594
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	44,730
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	47,521
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	49,233
June	31,713	24,272	22,753	35,822	28,598	33,801	37,676	43,227
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	41,526
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	38,274
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	

Figures on Quarterly Basis

Quarter	1922	1923	1924	1925	1926	1927	1928	1929
Jan./Mar.		96,776	87,609	95,263	94,301	99,216	103,558	128,565
Apr./June	127,360	89,493	75,674	104,099	87,109	103,242	103,500	139,292
July/Sept.		55,621	83,813	99,493	93,793	89,210	117,573	
Oct./Dec.	155,067	63,617	92,656	85,789	83,212	80,860	117,597	
Totals	282,427	305,507	339,752	384,644	358,415	372,528	442,227	267,857

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
July 6	6,123	358	1,909	86	8,476
July 13	6,648	927	1,708	7	9,290
July 20	5,107	839	1,313	56	7,315
July 27	6,649	432	1,988	75	9,144
Aug. 3	4,784	780	1,251	10	6,825
Aug. 10	5,850	873	1,222	—	7,945
Aug. 17	5,444	593	1,444	33	7,514
Aug. 24	5,560	602	1,401	23	7,586
Aug. 31	5,408	657	1,338	3	7,406
Sept. 7	8,313	1,691	1,256	38	11,298
Sept. 14	7,318	1,080	1,674	37	10.109
Sept. 21	7,514	533	1,549	15	9,611
Sept. 28	6,861	1,975	1,456	140	10,432

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1927																																
March	39¾	39⅝	40	40¾	41	41	40⅞	40⅝	40⅝	40⅝	41½	41⅝	41⅝	41⅝	41⅝	41⅝	41⅝	41½	41½	41½	41⅝	41½	40⅞	41¼	41¼	41½	—	40⅞	41			41
April	41⅜	41⅛	41	41	41¼	41¼	41⅛	41⅛	41⅛	40⅝	41⅛	41	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40½	40½	40⅝	40⅝	40½	41¼	41⅛	40⅞
May	—	41	40½	41	41	40⅝	40⅝	40⅝	40⅝	—	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40⅝	40½	—	40⅝	40⅝
June	40⅝	40⅜	40¼	40¼	40¼	39⅞	39⅞	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	40⅛	—	40⅛
July	35½	35¼	35¼	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝
August	35¼	35¼	35¼	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝
Sept.	34	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	34	34	34	34	34	34	34	33⅝	34	34	34	34	34	34	34	34	34	34	34
Oct.	33⅝	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜	33⅜
Nov.	35	35¼	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛	35⅛
Dec.	40⅛	40¼	40¼	40⅜	40⅜	40⅜	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
1926																																
January	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
February	37½	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾
March	29	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½	28½
April	23	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼
May	17½	17¾	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛
June	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
July	19½	19½	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
August	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
September	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
October	18¾	18½	18½	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾
November	18¾	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞
December	17¾	—	17¾	17¾	17¾	17¾	17¾	17¾	18	18	18	18	18	18	18	18	17⅞	17⅞	18	18	18	18	18	18	18	18	18	18	18	18	18	18
1929																																
January	—	18¼	18⅛	18¼	18¼	18¼	18¼	18¼	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛
February	22⅝	22	21⅝	21⅝	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼
March	26	26	25	25	26	26	25	25	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½
April	23	23¼	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½
May	19⅞	19⅝	19⅝	19⅝	20⅛	20⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛
June	21⅛	21⅜	21⅜	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼
July	20½	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Aug.	21⅜	21⅜	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Sept.	21⅜	21⅜	21	20¾	20¾	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞
Oct.	—	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97
Mar.	14.53	34.21	22.33	41.00	59.00	41.04	26.82	24.55
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.13
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	—
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	—
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	—
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	July	Aug.	Sept.	Oct.	Day	July	Aug.	Sept.	Oct.
1	10⅝	11	—	9⅝	17	11	10¼	10¼	—
2	10⅞	11	10¼	9½	18	10⅞	—	10¼	—
3	10⅞	—	10¼	9⅝	19	10⅝	10⅛	10¼	—
4	10⅞	—	10¼	—	20	10¾	10¼	10¼	—
5	11	—	10⅛	—	21	—	10¼	10¼	—
6	11¼	10⅞	10⅛	—	22	11	10¼	—	—
7	—	10⅞	10⅛	—	23	11	10¼	10¼	—
8	11⅛	10¾	—	—	24	10⅞	10⅝	10¼	—
9	11⅛	10¾	10⅛	—	25	11	—	10⅛	—
10	11⅛	10¾	10¼	—	26	11⅜	10⅝	10	—
11	11⅛	—	10¼	—	27	11⅛	10⅝	10	—
12	11¼	10⅝	10¼	—	28	—	10½	9¾	—
13	11¼	10⅝	10¼	—	29	11	10⅝	—	—
14	—	10⅝	10¼	—	30	11	10¼	9¾	—
15	11¼	10½	—	—	31	11	10¼	—	—
16	11	10⅝	10¼	—					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	10.505
Feb.	19.021	15.713	11.875	Sept.	16.293	8.530	10.160
Mar.	20.125	12.736	12.135	Oct.	16.366	8.807	—
Apr.	19.897	8.864	10.490	Nov.	18.159	8.596	—
May	19.769	8.845	10.717	Dec.	19.690	8.570	—
June	17.880	9.293	10.580	Average for Year	18.375	10.656	—
July	16.770	9.312	11.065				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.
1	—	18.80	11	18.75	—	21	18.55	—
2	—	18.95	12	18.70	—	22	—	—
4	19.55	18.90	13	18.70	—	23	18.55	—
4	19.25	—	14	18.70	—	24	18.45	—
5	19.10	—	15	—	—	25	18.85	—
6	19.20	—	16	18.70	—	26	18.70	—
7	19.20	—	17	18.70	—	27	18.70	—
8	—	—	18	18.60	—	28	18.70	—
9	19.35	—	19	18.65	—	29	—	—
10	18.95	—	20	18.65	—	30	18.70	—
						31	—	—

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	18.62
Feb.	14.10	18.40	20.21	Sept.	21.95	18.67	18.83
Mar.	14.32	19.38	20.19	Oct.	20.22	19.62	—
Apr.	14.75	20.63	20.29	Nov.	20.22	19.84	—
May	16.07	21.58	19.41	Dec.	19.58	20.22	—
June	16.85	21.50	18.74	Average for Year	17.49	19.97	—
July	18.00	21.36	18.62				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955	90,058	42,166	43,316	63,825	133,352	152,271	153,883
March	85,740	114,061	100,536	49,600	39,324	56,476	135,340	153,385	157,012
April	92,757	113,083	107,659	38,963	33,986	55,409	131,720	147,069	163,068
May	94,563	105,356	97,192	44,181	34,374	55,404	138,744	139,730	152,596
June	89,250	90,198	92,061	47,233	40,001	46,035	136,483	130,119	138,096
July	98,469	83,242	92,535	40,687	42,304	38,858	139,056	125,546	134,393
Aug.	96,148	68,994	90,769	40,937	51,875	41,618	137,085	120,869	132,387
Sept.	97,829	68,851		37,966	48,566		135,793	117,417	
Oct.	97,453	66,421		42,804	41,571		140,256	107,992	
Nov.	101,084	61,956		37,076	68,119		138,110	130,075	
Dec.	100,130	66,166		47,938	68,764		148,068	134,930	

(Rubber Manufacturers' Association figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1921	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524	25,191
Feb.	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964	25,554
Mar.	63,913	66,670	63,438	55,647	18,104	13,127	68,055	58,272	28,214
Apr.	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425	31,368
May	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628	31,290
June	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756	31,025
July	71,065	71,515	49,937	52,073	4,258	27,727	68,717	35,429	30,080
Aug.	73,211	72,112	58,427	49,700	4,619	30,165	64,491	32,084	35,605
Sept.	72,175	70,977	54,523	44,011	5,453	35,077	68,236	31,440	
Oct.	69,229	68,536	58,891	37,523	5,086	42,138	69,569	24,207	
Nov.	70,786	68,548	60,074	33,593	3,869	44,057	67,050	17,775	
Dec.	69,792	72,299	60,246	29,488	5,697	48,918	63,793	19,815	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1928					
September	31,933	31,477	32,110	31,884	31,462
October	29,525	27,370	26,477	24,240	
November	22,919	21,494	20,194	18,724	
December	16,855	16,517	17,669	18,821	19,727
1929					
January	21,953	23,016	23,547	24,423	
February	25,389	25,413	24,757	25,005	
March	25,441	25,920	26,442	27,656	28,077
April	28,934	30,446	30,503	31,213	
May	31,580	31,127	30,955	30,893	
June	31,539	31,635	31,127	30,617	30,982
July	29,996	30,661	30,790	30,167	
August	30,937	31,444	33,573	34,651	35,605
September	36,620	37,901	40,151	42,077	

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1927	1928	1929	End of	1927	1928	1929
Jan.	25,440	25,868	29,617	July	22,558	18,663	33,359
Feb.	26,766	22,867	32,373	Aug.	25,764	18,971	30,834
Mar.	27,844	20,538	29,437	Sept.	25,178	14,898	—
Apr.	24,543	16,946	26,474	Oct.	25,790	12,149	—
May	25,133	17,437	30,764	Nov.	28,369	29,188	—
June	21,898	18,207	30,403	Dec.	25,798	32,895	—

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1925	26,001,664	66.8	1928	24,247,282	81.6
1928			1929		
January	1,835,207	79.4	July	1,896,666	78.2
February	2,265,024	80.8	August	1,570,099	79.4
March	2,613,389	80.4	September	2,110,003	80.7
April	2,729,899	81.3	October		
May	2,574,224	76.5	November		
June	2,184,219	75.3	December		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1925	1926	1927	1928	1929
January	14,386,000	17,582,000	17,888,000	20,938,000	22,602,000
February	13,210,000	15,814,000	18,240,000	21,136,000	22,776,000
March	14,890,000	19,302,000	22,464,000	24,041,000	28,495,000
April	19,013,000	20,848,000	23,371,000	25,712,000	32,019,000
May	20,459,000	24,213,000	26,579,000	27,355,000	34,117,000
June	20,724,000	23,803,000	27,799,000	29,022,000	33,163,000
July	22,879,000	24,752,000	29,784,000	30,960,000	36,860,000
August	22,323,000	26,912,000	29,779,000	33,148,000	37,759,000
September	20,177,000	22,929,000	28,409,000	29,691,000	
October	19,826,000	23,973,000	25,497,000	30,610,000	
November	18,024,000	20,618,000	24,400,000	26,222,000	
December	17,954,000	21,419,000	23,718,000	26,644,000	
TOTAL	223,865,000	262,165,000	297,928,000	327,932,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	4,965	5,358	6,722	4,932	5,394	6,626	10,432	9,949	13,712
Feb.	5,095	6,363	6,912	4,458	5,031	5,282	11,075	11,721	15,495
Mar.	6,276	6,819	7,519	5,701	5,731	6,708	11,583	12,389	16,351
Apr.	6,299	6,178	7,884	5,701	5,812	7,294	12,122	12,71.	16,929
May	6,151	6,759	8,145	5,657	6,457	7,184	12,462	13,024	17,849
June	6,202	6,692	7,304	6,253	7,117	7,254	12,462	12,162	17,957
July	5,087	6,498	6,475	5,973	7,895	7,855	11,326	11,157	15,830
Aug.	5,752	7,469		6,393	8,403		10,721	10,034	
Sept.	4,822	6,802		5,717	7,145		9,722	9,765	
Oct.	4,773	7,326		4,799	5,717		9,665	11,520	
Nov.	4,502	6,075		4,306	4,998		10,136	12,579	
Dec.	4,497	5,605		4,165	4,591		10,264	13,624	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	5,337	5,441	6,517	6,016	6,072	7,242	15,585	12,982	15,386
Feb.	5,658	6,895	6,769	5,120	5,431	5,278	16,075	14,650	16,999
Mar.	7,184	6,231	7,466	6,157	5,731	6,737	17,096	15,573	17,750
Apr.	7,373	6,661	7,634	6,359	5,702	7,164	17,801	16,638	18,134
May	6,737	7,163	7,660	6,140	6,300	7,038	18,389	17,702	18,928
June	6,306	6,953	6,978	6,832	7,136	6,950	17,858	17,159	18,741
July	5,284	6,674	6,178	7,070	8,729	8,113	16,004	14,974	16,332
Aug.	6,480	8,343		7,983	9,350		14,664	13,931	
Sept.	5,651	7,103		6,758	7,154		13,511	13,543	
Oct.	5,065	6,929		5,024	5,662		13,539	15,285	
Nov.	4,775	5,592		4,723	5,002		13,585	15,743	
Dec.	4,969	5,184		4,712	4,858		13,692	16,117	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	282,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	237,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	28,486	2,801	497,371
March	584,733	513,266	69,539	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[4]						
	Gross Exports	Gross Exports Minus Imports	Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[4]	Amazon Valley	All Other[6]	World Total[7]
1923	232,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1927:															
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,880	1,605	842	581	525	4,851	7,988	11,774	1,100	2,273	1,025	47,565
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,860
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,499
Apr.	20,139	9,335	10,804	3,233	789	630	494	258	3,993	5,040	5,499	736	1,014	1,323	33,810
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,355	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,488	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	73,952
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	500*	306	5,997	6,645	11,321	568	1,950	569	72,829*
May	43,960	15,593	28,367	5,723	800	966	500*	453	6,264	6,961	13,437	650	1,922	733	66,776*
June	40,398	14,344	26,054	5,563	1,122	1,061	500*	422	5,582	6,693	11,270	608	1,398	650*	60,923*
July	46,454	15,071	31,383	5,457	974	1,247	500*	462	6,422	7,192	13,995	555	1,457	700*	70,344*
Aug.	50,441	15,449	34,972	5,564		993	500*	431	4,644	7,298	10,782	545	1,563		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included— such shipments were equivalent to 15 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[a]	United Kingdom	France (b)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,758	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,879
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,495	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,688	11,117	11,412	7,088	4,757	2,950	875	3,149	1,155	1,558	516,491
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,649
1927	398,488	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	596,695
1927:															
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,361	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,813
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,114	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	31	337	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,331	5,179	5,001	4,613	2,908	2,727	1,259	684	1,131	627	113	226	115	356	86,275
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	700*	1,437	854	201	468	37	277	70,938*
June	38,676	5,361	6,814	3,948	3,075	1,593	1,624	700*	2,215	672	687	507	24	420	66,316*
July	40,914	4,993	1,967	3,559	3,205	2,407	2,023		2,918	1,039	253	519			
Aug.	35,207	14,594		4,082											

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 208 tons in the first 5 months of 1929.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620 (2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1928:				
January	2,177,000	17,682,000	3,431,000	$5,630,000
February	2,575,000	19,181,000	3,628,000	5,838,000
March	2,853,000	22,583,000	3,747,000	6,675,000
April	2,416,000	18,575,000	2,928,000	5,406,000
May	2,744,000	21,597,000	3,519,000	6,274,000
June	2,953,000	18,763,000	3,321,000	6,126,000
July	3,447,000	17,620,000	3,168,000	5,157,000
August	4,613,000	21,289,000	3,461,000	6,306,000
September	4,966,000	21,451,000	2,725,000	5,393,000
October	5,914,000	21,932,000	2,297,000	5,837,000
November	4,173,000	18,686,000	2,649,000	5,201,000
December	2,348,000	15,811,000	2,771,000	5,271,000
1929:				
January	2,828,000	19,975,000	3,876,000	6,033,000
February	3,095,000	18,979,000	2,869,000	6,135,000
March	3,952,000	17,226,000	2,746,000	7,013,000
April	4,000,000	17,256,000	2,601,000	7,035,000
May	4,860,000	19,541,000	2,916,000	7,189,000
June	4,409,000	20,007,000	2,502,000	6,792,000
July	4,260,000			

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	845,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	851,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	893,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,218	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	—	399	165,460	451	126,962	147	60,738
Sept.	—	—	60	38,198	2,028	713,736	125	56,768
Oct.	—	—	121	59,358	429	129,065	239	94,570
Nov.	—	—	59	41,119	472	140,116	88	35,409
Dec.	—	—	83	58,311	522	156,154	145	59,911
1929:								
Jan.	—	—	46	30,374	484	152,260	138	62,950
Feb.	—	—	82	70,209	823	255,594	40	19,806
Mar.	—	—	90	75,444	428	122,026	1	1,140
Apr.	83	38,241	163	93,240	1,086	315,621	1	1,086
May	125	57,260	70	67,891	752	212,400	76	24,053
June	145	62,808	31	26,038	802	248,143	77	25,612
July	200	86,175	49	46,440	572	180,065	14	5,807
Aug	190	80,443	58	47,769	575	171,733	—	—

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*	Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,866	73,535	36.3	.....	1924	80,079	76,072	22.4	.....
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1927:									
Jan.	16,526	12,374	39.3	25,908	July	15,488	13,842	47.4	26,599
Feb.	15,860	14,424	47.8	27,291	Aug.	15,109	15,836	47.3	25,157
Mar.	16,788	13,528	37.4	27,124	Sept.	14,392	14,790	54.3	23,429
Apr.	14,483	16,677	46.5	25,712	Oct.	16,127	17,292	64.5	22,176
May	16,159	15,754	46.1	26,419	Nov.	15,477	14,876	55.5	21,728
June	16,652	15,547	46.0	25,811	Dec.	16,083	13,431	52.7	24,980
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,848	Aug.	19,049	17,890	41.7	15,881
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,283	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,137	Nov.	18,245	18,380	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.				
Apr.	19,899	22,435	47.3	20,680	Oct.				
May	20,385	23,176	47.1	19,479	Nov.				
June	18,416	18,141	42.0	17,980	Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927 and 9,577 tons in 1928.

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REVIEW DESK

Books, New Publications, Catalogues, Etc.

METHODS OF TEST RELATING TO ELECTRICAL INSULATING MATERIALS. Published by the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa. 1929. 180 pp.

Because of their importance in the prevention of fire and loss of life, insulating materials must be tested so as to prove their efficiency beyond question. All of the methods of making such tests prepared by Committee D-9 of the A. S. T. M. are included in this volume, together with its annual report presented at the Atlantic City meeting last June. Standard specifications for rubber gloves, friction tape, rubber matting and other items are given in full.

BRITISH TRADE IN RUBBER AND RUBBER PRODUCTS. By Robert B. Macatee. Published by the U. S. Department of Commerce, Washington, D. C. 1929. 20 pp.

Owing to its control over nearly half of the world's rubber acreage and to its early development of a domestic rubber manufacturing industry, the United Kingdom is the most important centre of the rubber trade outside the United States. Consul Robert B. Macatee, of London, has summarized in this report recent developments in the British market as disclosed by British statistics. The establishment of American branch factories is discussed, as well as current manufacturing trends in English plants.

STEARIC ACID IN LITHARGE-CURED RUBBER COMPOUNDS. By J. R. Sheppard. Published by the Eagle-Picher Lead Company, 134 North LaSalle Street, Chicago, Ill. 1929. 12 pp.

Litharge activation in vulcanization is treated in full in this paper, which was presented before the New York Rubber Group of the American Chemical Society last March. The latter half of the paper, dealing with stearic acid and litharge in conjunction with mercaptobenzothiazole, treats of a role of lead oxide in rubber which, in ordinary usage, if not in theory, has been sacrosanct to zinc oxide—that of activation of organic accelerators.

DOMESTIC AND FOREIGN AFFAIRS. Published by the Commission on Commerce and Marine, American Bankers Association, New York City. 1929. 52 pp.

A report on developments having a bearing upon the commerce of the United States, this little volume deals with both domestic affairs and foreign conditions. The diversion of passenger traffic from railroads to automotive transportation and the continued progress of aviation are among the topics discussed.

BIBLIOGRAPHY OF BIBLIOGRAPHIES ON CHEMISTRY AND CHEMICAL TECHNOLOGY. Compiled by Clarence J. West and D. D. Berolzheimer. Published by the National Research Council of the National Academy of Sciences, Washington, D. C. 1929. 176 pp.

This volume, issued as Bulletin No. 71 of the National Research Council, is a supplement to the Bibliography of Bibliographies on Chemistry and Chemical Technology, published in 1925 as Bulletin No. 50 of the same body. Although most of the bibliographies listed have been published since 1924, many older ones have been included so as to make the united publication as complete as possible. There are copious listings under the headings of Rubber, Accelerators, Gutta-Percha, Latex and Vulcanization.

TRAINING PLANS FOR JUNIOR EXECUTIVES. Published by the Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. 1929. 40 pp.

Representative programs being undertaken by several large commercial and industrial establishments for the purpose of developing future department heads, supervisors and senior officers are incorporated in this volume, including those finding successful application in the General Motors Corporation, Bethlehem Steel Company, Standard Oil Company of New Jersey and Henry L. Doherty & Co.

ELECTRICITY FOR INDUSTRIAL HEATING. Published by the Commonwealth Edison Company. Chicago, Ill. 1929. 48 pp.

Thousands of successful applications of electricity for heating have been made and more are being perfected every days, according to the publishers of this volume. Typical examples in large industrial plants are illustrated and described.

TIRE TIPS. Published by the Rubber Manufacturers Association, Inc., 250 West 57th Street, New York City. 1929. 16 pp.

Illustrated copiously, this educational pamphlet describes the results of under-inflation, misalignment and brake wear and gives the reasons for fabric breaks, shoulder breaks, tread injuries, bead injuries and pinched tubes. It presents a table of correct inflation pressures for 1929 model cars. This pamphlet, prepared by the service managers committee of the tire manufacturers division of the R. M. A., will have an initial circulation of 3,500,000 copies, going chiefly to new car purchasers.

ANNUAL REPORT, 1928. Published by the Rubber Research Institute of Malaya, Kuala Lumpur, F. M. S. 1929. 128 pp.

The need for scientific investigation of the varied problems of rubber growing in the Eastern tropics is well recognized, and the Rubber Research Institute, since its inception late in 1926, has already tended to justify its establishment. This first report by Dr. Bryce and his associates details the work that has been performed in botanical, chemical, pathological, soil, and bacteriological study.

FLEXIBLE COUPLINGS. Published by the Poole Engineering & Machine Company, Baltimore, Md. 1929. 36 pp.

The advantage of using flexible couplings on all direct connected machinery is now generally recognized and appreciated by engineers, as these couplings tend to compensate for the usual and unavoidable errors in alignment and should allow free lateral float to the connected shafts. Their history and value in use are described in this attractively prepared manual and specific applications are illustrated by photographs and working drawings.

TENSILE PROPERTIES OF SOFT RUBBER COMPOUNDS. By R. F. Tener, S. S. Kingsbury, and W. L. Holt. Published by the Bureau of Standards, Washington, D. C. 1928. 16 pp.

This paper gives the results of tensile tests of six rubber compounds when tested at temperatures ranging from —70° to +147° C. The results show that at low temperatures rubber becomes rigid with an increased tensile strength and at high temperatures it possesses practically no tensile strength.

GASTEX CARBON. Published by the General Atlas Chemical Company, 60 Wall Street, New York City. 1929. 16 pp.

Recent data obtained by laboratory studies, together with general material on the properties and uses of this new reenforcing carbon black for the rubber industry, are embodied in this booklet. Supplementary bulletins will be issued as additional data are secured.

GENERAL SALES OR TURNOVER TAXATION. Published by the National Industrial Conference Board, 247 Park Avenue, New York City. 1929. 190 pp.

Steady growth in public expenditures of the federal, state and local governments raises the question of finding new sources of public revenue. Does a tax on sales or turnover of commodities, property or services offer a solution for some of the problems of American public finance? The present study gives a comprehensive analysis of the various types of general sales and turnover taxes, eliminates confusion regarding their meaning, examines the economic and social effects of this type of taxation, and throws light on problems of tax administration and constitutional considerations. The experience of 16 foreign countries and the United States with various forms of sales taxation is presented in detail.

PUBLIC REGULATION OF COMPETITIVE PRACTICES. Published by the National Industrial Conference Board, 247 Park Avenue, New York City. 1929. 310 pp.

Every year sees new developments in the interpretation of the "anti-trust" law, in the regulation of price and trade relation policies, in less-than-cost selling in resale price maintenance, and other phases of this subject. This is a second and revised edition of what has come to be regarded as an authoritative book on the problem and presents much new material, including a chapter on the Trade Practice Conference.